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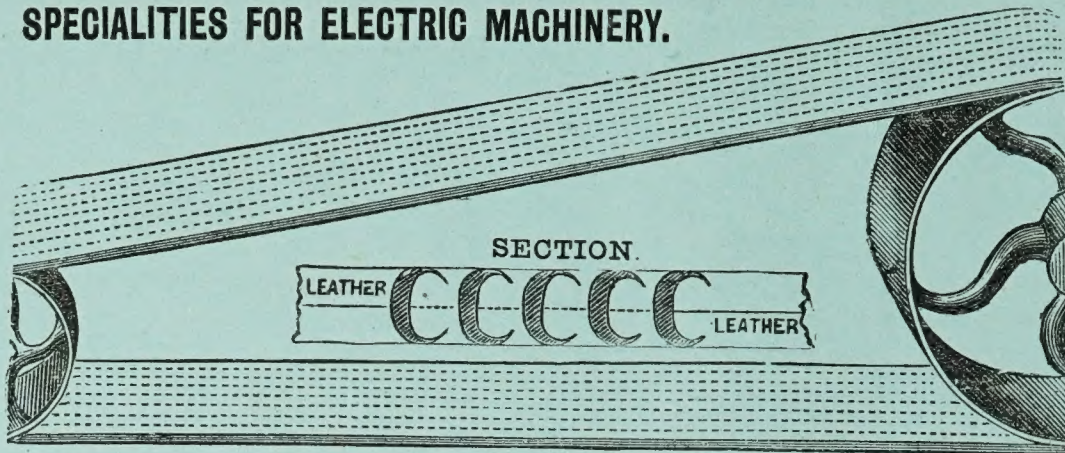
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We beg to thank our friends for the generous support which they have extended to us, during more than five years, since this Journal was established. We have, in this period, given a great number of designs for every class of fabric, and as regards the designs for ornamental fabrics, we have hitherto stood alone, having, in this branch, had an entire monopoly amongst the textile journals of the world. In designs for Mantle Cloths, and in those for Ladies' and Gentlemen's clothing materials of every variety, including Worsteds, Tweeds, Cheviots, &c., we have always endeavoured to be in the front rank, keeping as nearly as possible to the leading styles for each changing season. To enable us to do this with accuracy, most of our designs are produced in cloth before being published. To render this department of our Journal as valuable as possible, we have decided to give each month, commencing with February, 1887,

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the Designs for which will be found in the usual place in our Journal. This is a feature hitherto only carried out by the proprietors of *one* Continental publication, which is issued at a high price, and, in undertaking it ourselves, we are conscious

of the great expense we shall incur. We therefore ask our Textile friends to give us their active support, in order to render the experiment—which we shall try for one year—a complete success.

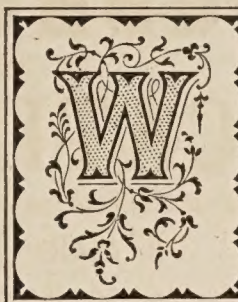
In addition to this, we have also had in consideration the opening of a *Department of Sale and Exchange* in our columns. This feature, if carefully carried out, is capable of great benefit to our readers. It is our intention to print Advertisements for our Subscribers, (which are *not* strictly trade advertisements) free of charge under certain regulations. The class of advertisements which will be accepted are such as the following:—Partnerships Desired or Offered, Situations Vacant or Wanted, Mill Premises to be Sold or to be Let. We are desirous to make the scope of this department as wide as possible, but, as before stated, all strictly trade advertisements will be excluded, and a restriction will be placed upon the length of each advertisement; not more than six lines, single column, small type, being allowed.

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The Imperial Institute.



Give the substance of the report of the Committee appointed by H. R. H. the Prince of Wales to frame a scheme for an Imperial Institute. They state that their desire in framing the scheme is to combine in a harmonious form, and with a view to some practical and useful purpose, a representation of the Colonies and India on the one hand, and of the United Kingdom on the other, and they think this object will be best indicated by giving the memorial the title of "The Imperial Institute of the United Kingdom, the Colonies, and India." They think that the Institute should have its home in buildings suitable to worthily commemorate the jubilee year of Her Majesty's reign, and to afford accommodation sufficient for an institution which shall combine the important objects intended to be carried out by this memorial. It is obvious, they state, that some portions of the building—such as the hall, conference rooms, &c., will be common to the Colonies, India, and the United Kingdom; but as others have special relation to a particular portion of Her Majesty's dominions, they propose to make the following divisions:—

A.—COLONIAL AND INDIAN SECTION.—The object of this section will be to illustrate the great commercial and industrial resources of the Colonies and India, and to spread a knowledge of their progress and social condition. To this end provision should be made for:—1. The display, in an adequate manner, of the best natural and manufactured products of the Colonies and India, and in connection with this the circulation of typical collections throughout the United Kingdom. 2. A hall for the discussion of Colonial and Indian subjects, and for receptions connected with the Colonies and India. 3. The formation of Colonial and Indian libraries, and in establishing, in connection therewith, reading, news, and intelligence rooms. 4. The incorporation, in some form, into the proposed Institute of the Royal Colonial Institute and Royal Asiatic Society, if, as is hoped, it be possible to bring about such a union. 5. The collection and diffusion of the fullest information in regard to the industrial and material condition of the Colonies, so as to enable intending emigrants to acquire all requisite knowledge; such information might be advantageously supplemented by simple and practical instruction. An emigration office of this character should be in correspondence with the provincial towns, either through the free libraries or by other means, so that information may be readily accessible to the people. These objects would be greatly facilitated if, as may be hoped, the Government should consent to the transfer to the buildings of the Institute of the recently-formed Emigration Department, which would, by a close connection with the Institute, largely increase its usefulness. Facilities might be afforded for the exhibition of works of Colonial and Indian art. It is also considered desirable that means should be provided, not for a general exhibition, but for occasional special exhibitions of

Colonial and Indian produce and manufactures. At one time, a particular colony, or portion of the empire, may desire to show its progress. At another time, a general comparison of particular industries may be useful. While the permanent galleries would exhibit the usual commercial or industrial products of the several Colonies and India, the occasional exhibitions would stimulate and enlist the sympathies of Colonial and Indian producers, and keep up an active co-operation with the industrial classes of this country.

B.—UNITED KINGDOM SECTION.—The leading objects of this section will be to exhibit the development during Her Majesty's reign, and the present condition of the natural and manufactured products of the United Kingdom, and to afford such stimulus and knowledge as will lead to still further development, and thus increase the industrial prosperity of the country. The Committee propose to carry out these objects by making provision for the following purposes:—1. Comprehensive collections of the natural products of the United Kingdom, and of such products of other nations as are employed in its industries, with full scientific, practical, and commercial information relating thereto. 2. Illustrations of manufactured products, typical of their development, and present condition of trades and handicrafts, and their progress during the Queen's reign, including illustrations of foreign work when necessary for comparison, together with models illustrating naval architecture, engineering, mining, and architectural works. 3. A library for industrial, commercial, and economic study, which should contain standard works and reports on all subjects of trade and commerce. It will be desirable also to include a library of inventions of the empire, and as far as possible of the United States and other countries. 4. Reading and conference rooms supplied with English, colonial, and foreign commercial and technical periodicals, and a fully-equipped map-room for geographical and geological reference. The conference-rooms would be of value for meetings of Chambers of Commerce and other bodies of a kindred nature. 5. The promotion in affiliation with the Imperial Institute of commercial museums in the City of London and in the commercial centres of the provinces. To these the Institute would contribute specimens, samples, and exhibits of the commercial products likely to be specially valuable to particular localities. There should also be an organisation to connect the Imperial Institute with the provincial centres by lectures, conferences, the circulation of specimens, and other means. It is hoped that the Institute may lead to the organisation of high schools of commerce, such as are now established in the chief commercial towns of most Continental countries, but which have as yet unfortunately no existence in the United Kingdom. 6. The building will also advantageously afford accommodation for (a) comparing and examining samples by the resources of modern science, and (b) the examination of artisans under the various schemes already existing for the promotion of technical education. Space should also be provided for occasional exhibitions of separate industries, or of the special industries carried on in great provincial centres: for example, there might at one time be an exhibition of iron manufactures, at another of pottery, at another of textile fabrics, &c., which would tend to stimulate improvement in the different departments of industrial life. This object might be assisted by separate exhibitions of the handiwork of artisans. The committee having detailed the general nature of their suggestions under these heads, desire to add that they do not anticipate the exhibits in the collections remaining unchanged. They contemplate that, as improvements are made from time to time, the later and better results would displace those out of date. They have had to consider how the space should be distributed between the United Kingdom on the one hand, and the Colonies and India on the other, and they recommend that whatever portion of the buildings is not required for purposes manifestly common to both should be allotted to the two sections fairly in equal parts.

C.—GOVERNMENT OF INSTITUTE.—The committee recommend that a new body entirely independent of any existing organisation should be created for the government of the Institute. This body should be thoroughly representative of the great commercial and industrial interests of the Empire. The Colonies and India should have a fair share in the government of the Institute, and each colony should have special charge of its own particular department, subject, of course, to the general management of the entire Institution. The method of carrying this out would be prescribed by the charter, after full consideration by Her Majesty in Council.

D.—SITE.—The committee being fully conscious of the advantage of a central position for the Institute, have considered the various possible sites, and have, as far as has been within their power, obtained estimates of their cost. To carry out the several objects which have been indicated, a large space is necessary. The committee have been unable to find any such suitable site in the central parts of London, except at a cost which, looking at the probable amount of subscriptions, would, after the purchase of the ground, leave a sum wholly inadequate for the erection and maintenance of the buildings, and for carrying out the objects of the Institute. They have been obliged, therefore, to abandon the hope of obtaining a central position, and have turned their attention to the property at South Kensington belonging to the Commissioners for the Exhibition for 1851, and, while sensible of the objections that may be urged against the situation, the committee think that the advantages must be obvious of obtaining a sufficient site virtually free of cost, so that the whole of the subscriptions may be devoted to providing a building for establishing and maintaining the Institute. The committee add that there are some advantages to be taken into consideration in connection with the South Kensington site. In that locality are combined the City and Guilds Technical College, the Royal College of Music, and the Government Museums and Schools of Science and Art, which ought to be in immediate proximity to an Imperial Institute of the character which we have described. The technical character of the collections and exhibitions of the Imperial Institute has a natural connection with the collections of science and art in the Government Museums.

E.—GENERAL OBSERVATIONS.—An Imperial Institute for the United Kingdom, the Colonies, and India, would fall in its chief object if it did not constantly keep in view that it ought to be a centre for diffusing and extending knowledge in relation to the industrial resources and commerce of the Empire. The necessity for technical education is now fully appreciated, because the competition of industry has become in a great measure a competition of trained intelligence. The committee, however, do not recommend that the Imperial Institute should aspire to be a college for technical education. Many of the large towns in Great Britain have recently established colleges or schools of science and art. The Imperial Institute might serve to promote technical education in these, and to unite them with colleges of larger resources which have been founded or formed branches for the purpose in the metropolis. It is too much to hope that an active co-operation of this character between the provincial centres and London could be at once undertaken by the Imperial Institute. But the committee bear in mind that, in their last report, the Commissioners of 1851 have indicated an intention to assist in carrying out such a scheme. If the Commissioners would contribute three or four thousand pounds annually, it would be possible to establish scholarships, which might enable promising candidates of the working classes to attend the local institutions, and even, when it was desired, to complete their technical education in colleges of the metropolis. In addition to this aid, the Imperial Institute might be able in other ways to promote the foundation of scholarships both in connection with the Colonies and provincial centres, in the hope of still further extending these benefits to the working-classes.

In connection with the Imperial Institute, we cannot avoid expressing a feeling of disappointment at the probable situation of the building. It is pointed out that the neighbourhood of South Kensington possesses some peculiar advantages over any other site—the chief of which is that the ground may be obtained free of cost. This is, no doubt, a very strong argument in its favour, when we take into consideration the enormous value of ground in and around the City, but, to us, it seems doubtful whether the Institute will be of the same value in a commercial point of view as it would in the immediate vicinity of the City. Very many busy commercial men journey from the provinces to the metropolis for a few hours' stay only, and having completed the special business which took them there, may have an hour or two to spare, which they could, with great profit to their trade, spend in the Institute if it were close at hand; but should they have to occupy half the time at their disposal in going to and from the place, then they would consider it useless to attempt the visit, and would return to duties, which could not be left for a longer period, without having received the advantage they might have gained under more favourable circumstances. The Committee look forward to the Institute being in a better financial position from the fact that there will be no deduction from the subscriptions for land purchase, but is it not possible that, if the Institute be at South Kensington, many commercial men of the provinces may not consider themselves called upon to give so liberally as they would if it were to occupy a more central position?



Ornamental Form.



THE third of the series of Lectures on Art, at the Yorkshire College, was given by Mr. Lewis F. Day, who dealt with "The Fitness of Ornamental Form." He said one could scarcely conceive of ornament which was not in a manner more or less modified by considerations altogether apart from the natural forms on which it might have been founded. Even the human form, which is our highest type, and with which less liberty may be taken than with any other of nature's works, is not ready-made to the hand of the sculptor, and the works of the great masters to which we accord the title of "monumental" are so in virtue of a something which was not in the model of the sculptor, but in his art. The very position and purpose of ornament, the method of its execution, and even its construction, insisted upon some treatment of natural forms. The mere repetition, which was inevitable, would of itself render such treatment necessary, and even without the inducement of economy, we should still resort to repetition, if only because the human brain could not go on inventing without intermission, but needed the comparative rest of repeating itself, even in hand work. The only question was where, and to what extent, they should avail themselves of it? In proportion to the naturalism of a design, and the point of realism to which it was carried, it became unsuited to multiplication. To put it the other way about, the oftener it was proposed to repeat a form, the more imperative it was that it should be removed from the imitation of nature. It needed, in short, adaptation to the purpose of repetition, and it was adapted only in proportion to what he might call its reticence. A highly elaborate and attractive feature, anything that is in the least self-assertive, would not bear so much as reduplication, whereas any insignificant device might be multiplied *ad infinitum*. The presumable reason for introducing figures into ornamental design was for the sake of some added interest or suggestion there might be in them. But they could not get up any absorbing interest in a series of figures all identically of one pattern. They suggested only the mechanical means

employed in producing them. The multiplication of the figure, far from multiplying its interest, diminished it in exact proportion to the number of times it was repeated. The only safety was in toning down the repeated form until its recurrence ceased to be very obvious. This might be effected in various ways. In certain leather, paper, and such like designs, it was brought about partly by the low relief of the stamping, partly by the softness of the colouring, and partly by a more or less cunning complication of the Cupids (or whatever they might be) with the rest of the design, so that they did not thrust themselves into notice. The consideration which occurred in such a case was whether it was then worth doing? Useful as an outline was in decoration, it was not inevitable. Nor was it so easy to say just where the outline should be used. In very many cases the material and its workmanlike employment necessitated an outline, and even determined its colour. It was seldom, however, that an artist, would resort, of his own free will, to an even and rigid outline all round every form. Excepting at a great distance from the eye, where its mechanical quality was not seen, that was almost certain to result in hardness, a defect which was very commonly looked upon as a merit of execution. Mechanical precision was too often the manufacturer's ideal of finish. It was one, unfortunately, which he could all too easily realise, at a cost of what beauty of feeling and colour he could probably never be brought to know. The instinct of art was rather to lose an outline, more or less in places, and only to insist upon it where its value was sufficient to justify the risk its use entailed. The only rule which could be laid down as to the use of outline was so extremely simple as not to satisfy the doctrinaire. If the need of an outline was urgent, then adopt it; but if no such want was felt, why insist upon its use? The insistence upon outline for the sake of outline, as though decoration was not decoration without this official stamp of pedantry—this trade mark of the decorating shop—was pure nonsense. Outline was frequently a matter of trade expediency and no more. And a very wise and fit expedient it was if only in view of that process of reproduction which was one of the necessities of modern decoration, and particularly of modern ornament. The vaguer forms, which depended so much upon the touch and feeling of the artist, did not lend themselves to this necessity. Now, an outline did; and if in outlining his drawing, the designer could not help, in some degree, hardening it, the evil was infinitely less than if the more undefined and delicate forms had been left to the tender mercies of another. Decorative art was a kind of shorthand. Its very existence seemed to depend upon its being done with readiness, quickness, and certainty. That which asked for careful scrutiny to be appreciated, would, for the most part, fail to win appreciation; it might have all manner of merits, but if it hid them, it had no right to complain that men passed them by. Poetry itself that was over subtle was not popular, and decorative art was essentially popular art.

The last of the series of lectures on art was on "The Study of Design," in the course of which Mr. Day said he would have a student of design well grounded, to begin with, in practical geometry. He would set him to work somewhat on the kindergarten principle, making up geometric patterns. As he grew beyond this, he would let him draw freer and more flowing forms, until he could produce, with the brush, ornaments such as the Greek pot-painters drew on their vases. Simultaneously with this, he might be making intelligent studies of leaves, flowers, and the growth of plants, as well as of the best examples of applied design. His studies should be studies, not pictures. Show drawings were so much waste of energy that might be much better employed. Ornament once mastered, he might pass on, if so inclined, to the study of animal form, and even of the human figure. A pupil should never be allowed to make a design without having a distinct idea as to how it was to be carried out. He should be taught to understand that design was one continuing solving of problems, a series of perpetual adjustment of the claims of art and of necessity. In all designs for reproduction, there should be the utmost simplicity and directness of execution; nothing should be slurred over; every line should be clear and firm. The decorator should readily accept the conditions to which his design was subject, not only adapting himself to them, but taking to them kindly. Training in practical work could not begin too soon. It might sound feasible enough that one should first learn the theory of design, and then be taught to apply what he had learnt, but the aim of education was not to cram so much theory into the student which he might make use of in his craft. The most profitable lesson we learnt at school was how to learn. And so he would teach the student how to study design, and the best way of doing that would be to take him to the workshop, and to show him what there was to learn there, and what to avoid. It was far better to take the sturdy workshop faculty and cultivate that, than to rear a kind of exotic or over-cultivated art upon which the atmosphere of the workshop acted only as a chill. It was the fashion to declare that the basis of all art was figure-drawing, that the best preparation for a design of ornament was to acquire a knowledge of human form and a facility of representing it. History and experience went to prove that this assumption was unfounded. The great painters who tried their hand at ornament mostly failed. He did not mean to say that the study of the figure might not be valuable to the designer. What he doubted was whether his time might not be employed to better purpose. As far as the supplementary studies were concerned, he fancied that, of the sciences, botany would be to more purpose than anatomy, and of the arts, flower-painting more to the purpose

than figure-painting. The familiar argument was that the study of figure was necessary, because in it the student must be exact. They might take liberties, it was said, with plant forms and the like, and no one would be any the wiser, the proportions being more or less variable. It was partly for that reason that the study of vegetable, rather than animal, anatomy recommended itself to the ornamental designer. He could not accustom himself too soon to accept natural form as something not to be copied, but to be turned to ornamental account, to be used inasmuch as it lent itself to ornament, and in a manner most conformable to ornament, or to be rejected, if it would not so accommodate itself. And just in so far as the human form would not permit of modification and adaptation was it unfit for use in ornament. Granted that the habit of working from the human model developed more than anything the faculty of exact and accurate reproduction of nature, but that was not the faculty which needed most encouragement in the designer. On the contrary, the habit of adhering rigorously to natural fact was a positive hindrance to design. It was of infinitely more importance in ornament that the opposite habit of adapting and modifying always should be encouraged. The designer must think first of a design. And, indeed, it was better that he should not even refer too much to actual studies from nature. Their thoughts must be concentrated always upon the lines and masses of their ornament. The consideration of natural proportions only hampered the free development of design. Something like exact study from nature might be necessary, but even plant form was not such a lawless thing as figure painters might think. The proportions of the parts of plants varied happily, but the construction of vegetable forms was scarcely less scientifically certain than the order of bones and muscles. He did not mean that figure drawing was superfluous; in some branches of design it was perhaps indispensable, and it was useful in many others; but it was a supplementary or subsidiary branch of training in ornament, and certainly not the basis of it all. On the other hand, there were limits to merely technical teaching. In France, a designer of textile fabrics had to go through an elaborate course of technical instruction. He had to master the technique of weaving and to know how every shade of colour in his design could be produced in threads. It was more than doubtful whether quite so much as this was necessary or desirable at all. The designer for textiles did well to analyse the best examples of weaving; only by such means could he quite fully realise what might be done without waste of labour and material. But that he should be a practical weaver, or even an expert in putting the pattern on to ruled paper, did not seem to him of the least use in the world. The problem we had to solve was how to infuse into modern manufacture something in the nature of artistic interest. The choice is no longer open to us whether we will divide our labour or not, and he did not think it was at all worth while that the designer should spend a very large proportion of his time in the mere mechanical part of pattern draughting. It was quite enough for the designer to make himself master of what could be done in weaving without knowing exactly, thread for thread, how it was done. There should be co-operation of the various skilled workers employed. The weaver should explain to the designer the conditions under which he must work, and he in turn should explain to the weaver the effect he wanted to produce, leaving something to him in the way of texture at least, and the method of producing it. A design need not be draughted by the artist; but it must be draughtable. It must be quite clear how many tints were meant to be employed, and where one ended and the next began. There must be no vagueness; there must be no feeling and fudging up to an effect. Every shade and every line must be clear, precise, and workmanlike. The designer who would do anything worth doing must be very much in earnest.

Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the four weeks ending Saturday, December 25th, was 385. The number in the corresponding four weeks of last year was 339, showing an increase of 46, being a net increase, in 1886, to date, of 482. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, December 25th, was 1,094. The number in the corresponding four weeks of last year was 1,066, showing an increase of 28, being a net increase, in 1886, to date, of 394. The number published in Ireland for the same four weeks was 74. The number in the corresponding four weeks of last year was 67, showing an increase of 7, being a net increase, in 1886, to date, of 112.

Trade advices from Adelaide (South Australia) by last mail are, we understand, of a very assuring character. The harvest has turned out well, and beyond what was expected, the silver and gold mines are being proved to be worth the while of emigrants, who are arriving in numbers from Sydney and Melbourne, and the recent bank amalgamation has helped the general feeling of confidence, which was broken by the failure of the Commercial Bank of South Australia.



The Development of Trade with Thibet.

IN connection with the Bradford Chamber of Commerce, a lecture has been given by Mr. H. J. Elwes, (commercial member of the late British Mission to Thibet), on the above subject. The Chairman (Mr. J. M. McLaren), in introducing the lecturer, said—"In times like the present, when the products of such towns as Bradford were shut out from many continental markets in consequence of prohibitive tariffs, it became a matter of anxiety whether they should not seek to open fresh markets to replace those of which they had been deprived. Mr. Elwes would tell them that Thibet possessed a climate particularly well adapted for the manufactures of Bradford, and was, as yet, largely an unknown and unexplored country. There was also every reason to believe that the people of Thibet would have a great deal more commodities than wool to give Bradford traders in exchange for Bradford products.—Mr. Elwes said he had been specially interested in the country of Thibet for sixteen years, and, at the last moment, when the British Mission was about to set out for that country, he had been requested by the Government to join it, and to make as many inquiries as possible relative to the prospects of trade with the inhabitants. At present, the only access to Thibet was from the south of Sikkim, and less was known about the country than was known of any other of similar extent in the world. Native surveyors—who, however, had been harassed by the suspicion that was invariably shown towards foreigners—had travelled through the southern part, and from their accounts, a very tolerable idea had been formed of the people of Thibet. The Thibetians asserted that they were quite willing to admit foreign traders into their territory, but were prevented by the Chinese, under whose rule they had been during the present century. However, the Thibetians still retained a large amount of power, for, although permission had been given by China for the British Mission to visit Thibet, they succeeded in influencing the Chinese against that mission. There was abundant evidence that the free intercourse between Thibet and India was encouraged at the beginning of the century, but, after the Chinese entered into power, this state of things was altered. Thibet was one of the most remarkable countries in the world on account of its high elevation. Throughout the west, north, and centre, there were hardly any valleys of a lower elevation than 12,000 feet. Notwithstanding this, butter, produce, cattle, &c., could be obtained at very reasonable prices. It was said that, in the more remote parts of the country, the sheep went unshorn because the wool was of no value. The lecturer here produced two woollen Thibet blankets of coarse, durable manufacture, and observed that nothing could be made like them for the same money in England. The inhabitants were divided into two great classes—the nomads and the settled cultivators. The Lamas, or priests, formed a very large and influential part of the population, and were probably afraid of losing the complete hold they now possessed over the minds and property of the common people; for although they were keen traders themselves, they were, as a class, hostile to foreign intercourse. The love of trade among all classes was extremely strong. On the one side was Thibet, with its numerous population, and means of producing and exporting articles which India required, but could not produce; and on the other side was India, with the power of supplying, at very low rates, articles which the Thibetians needed, but which they could only procure at high prices, and by long and circuitous routes. First of all were the exports from Thibet. These consisted of gold dust, salt, borax, musk, and wool. Now, the opening of a new wool producing country would, no doubt, be looked upon with somewhat jealous eyes, yet it had already attracted the attention of German and Chinese firms in Calcutta. With regard to the articles of import, he was inclined to think the prospect was even more promising. Notwithstanding the numerous restrictions which were placed on the free passage of traders, the heavy duties levied on foreign imports, the difficulties of the road, and of payment, a very large and rapidly increasing demand existed for tea, cotton goods, hardware, and broadcloth. Tea was, perhaps, the greatest luxury of the Thibetians of all classes, and was drunk daily by the poorest of them, in the form of hard brick-like blocks, specially made in the Chinese province of Lyechnen, and sent, with enormous labour, to all parts of Thibet. In Assam and Sikkim—at the very gates of Thibet—the English tea-planters produced a much better article at much lower cost, but it could not be imported on account of the jealous way in which the Chinese guarded their own monopoly. Exports of iron and copper utensils, knives, and hardware, were also much valued, and were sold at a profit of 300 or 400 per cent. by pedlars who came down to purchase them at second or third hand in Darjeeling and Calcutta. Cotton and woollen goods were, however, the principal articles of interest, and in a climate of such extreme severity as Thibet, warm clothing was of the first importance; and although the

people were of a hardy nature, and wove stuffs for themselves, yet they vastly preferred, and would pay highly for, foreign goods. Broadcloth was considered by the rich as the most suitable object for making presents. None of the thousands of Lamas were without a cloth robe except from poverty, and, as they never washed themselves, the durability of the cloth and its power of resisting dirt were looked upon as important qualities. The northern Thibetians bought English broadcloth from the Mongolians, who, in their turn, secured it from Russian shops in Lower Mongolia at a cost of three or four times per yard the cost of the same article brought to Lhasa from Calcutta, *via* Nepal. Now, as the route *via* Nepal was twice as long, and much more difficult than that *via* Darjeeling, the Nepalese merchants, with a few Kashmins, being the only foreign traders allowed to reside at Lhasa, it seemed to him quite certain that, by sending European or native agents into Thibet to dispose of the goods at something more like the cost price, they would quadruple the consumption at once, and, by taking payment in wool, do a profitable trade. They who were accustomed, by dealing in immense quantities, to cut the profits as fine as possible, and were satisfied with moderate returns, could hardly conceive the difference which was made between the buying and selling price by native merchants, and when, to these large profits, they added heavy duties and the cost of carriage on men's backs for many days over roads impassable for beasts of burden, it was indeed wonderful that any cloth could be sold at all *via* Nepal. He had demonstrated to his own satisfaction that English goods would soon drive out the showy, but not so durable, German cloths, which had to some extent supplanted English goods in this market. It was necessary in this, as in other cases, to consult the tastes of the people in making consignments of goods. The Thibetians, living in a very cold, windy climate, wanted a very closely-woven heavy cloth, something in the style of what was made for hunting coats in England. They were very particular about colour, Yellow, orange, crimson, liver, blue, and green, were the favourite colours, but they must be rather dull than bright in their shades. The first four colours were worn by the Lamas, blue by the laymen, and green by the women. Besides the heavy cloths, they also purchased serges for lining, and cotton for under garments, but weight and durability were essential in those materials as well as in cloths. As trade marks were, all over Asia, considered as a guarantee of quality, and were the only way by which people, who could not read our language, could tell what they were buying, great care should be taken that no shoddy or inferior goods were sent out with the same trade mark as was borne by the better makes. Packages should not exceed 70lbs. or 80lbs. in weight, and should be packed in stout waterproof material. With reference to the routes by which trade would pass, the lecturer said he intended shortly to bring under the notice of the Geographical Society a route which he had discovered, and, if that route were improved, it would be possible to go from the plains of India to the Thibetian frontier in two or three days' easy riding, without crossing a single valley, or making a single descent of any note. If that route was opened, and a British Consul appointed to reside at some convenient point near the frontier of Thibet, he felt sure that the Nepalese route would be practically abandoned. After Mr. Colman Macaulay had visited the Thibet frontier, he submitted to Lord Randolph Churchill (the then Secretary of State for India) proposals for an Embassy to Thibet, and was deputed to Peking to obtain, if possible, the sanction of the Chinese Government to such a mission. This sanction was obtained, and extensive preparations were made in January last to carry out the plan. Whether the moment had then been favourable for such a mission was now open to doubt. If the Embassy could have started early in May, he believed they would have reached Lhasa without serious difficulty or opposition; but they were unable to start till June, when the heavy rains set in, and by that time the Thibetians had discussed the question and organised an opposition. As far as they could learn, it was the younger and more turbulent class of the Lamas who opposed the mission. The Chinese Governor at Lhasa, at that time, was a man of indifferent reputation, and the hostile Thibetians succeeded in inducing him to make the Chinese believe that he was unable to prevent hostilities on the part of the Thibetians towards the mission. The Burmese frontier question was also unsettled at this time, and the Indian Government, fearing a repetition of something like the Bhotan Mission failure of 1864, hesitated to give the order to start. In the meantime, the Thibetians grew bolder, and assembled a small force on the frontier. At the end of July, they suddenly heard that a convention had been concluded with China, by which the Burmese frontier question was settled in a manner more or less in accordance with our views, but, that in consideration of this, and of a promise from the Chinese to take steps to encourage and protect trade across the Thibetian frontier, the mission would be withdrawn; and so for the time had ended the first serious attempt made this century to open up trade with Thibet, and though he did not dispute the diplomacy shown by our Government, yet he could not believe the matter would be allowed to rest. We asked for no more than our treaties with China gave us a right to have, and there could be no question that the Chinese would be gainers rather than losers by granting it, as their own merchants, who did a good deal of business, complained bitterly of the way in which they were harassed and restricted. He believed that our Government was fully alive to the importance of the question, and that the Chinese were too intelligent and far-sighted to believe, as some of the Thibetians did, that we had any hostile intentions. This policy of isolation could not be kept up for ever, and the good relations in which

we now stood with China must bear fruit. He expected therefore to see in the course of the next year or so, a resumption of negotiations which would lead to better results. If we did not occupy the field, others would. Russian merchants were knocking at the door on the north and west. Germans on the east, and the French on the south-east. Markets of such size and importance were seldom found; and he felt sure that although the trade was in its infancy, China and Thibet were the largest and best markets in the world, with the exception of our own colonies, for British manufactures. Mr. Elwes stated in his second lecture to the above mentioned Chamber, that the population of Thibet is, according to some authorities, about 6,000,000, but he did not think any one could form an idea of the real number. The north and east parts are not so largely populated owing to the great elevation of the country, but in the south and west the population was larger, and in some of the valleys of that part rice is grown in great quantities. The area of the country exceeds that of Germany and Austria put together, and supposing this area contains only 6,000,000 people, there could be more business done between Yorkshire and the inhabitants of Thibet, owing to the severity of the climate, than with 60,000,000 Hindoos, and the Thibetians would be very glad to take the heavy woollens of Yorkshire, provided the width and colour of the goods were to their taste, in exchange for their home products. He thought the best plan to adopt, in order to bring about commercial relations with Thibet, was to wait a short time, say until April or May next, and then the Chamber might, by deputation or memorial, urge the Government to take advantage of the Chinese Convention of the 24th July, 1886, to enter into negotiation for the removal of the present restrictions. There was no doubt that some of the Lamas were very much influenced by China. Should this action of the Chamber not lead to any good, a question might be asked in the House of Commons, and, by perseverance, he was sure they would get all they wanted.—Sir Jacob Behrens suggested that so long as political and local circumstances rendered direct trade with the interior of Thibet difficult, if not impossible, we might adopt the means which, under similar conditions, had been employed from time immemorial for the carrying on of international trade in Europe, as well as in Asia. He referred to several of the great international fairs, of which those held at Leipzig and Nijni-Novgorod are the only survivors in Europe. The spread of modern means of locomotion had deprived the Leipzig and other fairs of much of their former importance; but that of Nijni did yet, and would probably long continue to offer the readiest means for the interchange of commodities between Europe and the far East. The place where the fair was held should be as accessible to the traders and caravans of Thibet as to Europeans and Indians, all carrying their goods to a common centre. Thus the difficulties of road and climate, and the extortions of middlemen, would be practically overcome, and a direct exchange of produce established, the value of which could not be over-estimated to Bradford and the whole of Yorkshire.

Hints to Cotton Manufacturers.

With a report from Arnoy, have been sent, and are now in the possession of the Manchester Chamber of Commerce, 56 specimens of cloth, which may be classified according to their province of origin. The first class consists of fabrics imported from Shanghai, in Kiangsu; the second of those from the adjoining Kuangtung, or Canton province; the third of those from Kiangsi, immediately to the west; and the fourth of cloths made in various parts of the province of Fukhein. "To each sample," the gentleman writes, "I have attached a label, which contains the serial number; the name, locality, and province of origin, price, length, and lastly some remarks on the character, use, and various other particulars of the specimen." After speaking of the retail buying price and the measurement, the house give the following particulars of packing:—"The modes of packing vary. Canton grass-cloths are made into parcels of 10 or 20 pieces, each piece protected by a wrapper of soft 'cotton paper,' and the whole parcel either placed in wooden packing-cases, or enclosed in an outer wrapper of oiled paper. I forward specimens of both kinds. The Swatow grass-cloths are made up into parcels of five, which, like the above, are either packed in wooden cases or wrapped in oiled paper. All the cloths imported from Shanghai are wrapped in paper and made up into bales of ten pieces, technically called *t'ung*, or 'barrels.' Those coming from the Kiangsi province are brought in 'barrels' of 15 pieces without any covering whatever. There is not, so far as I am aware, anything new that I can add of a general nature on this subject. It is well known already that the many millions of lower-class Chinese toiling throughout the 18 provinces, and in huge territories beyond them, do not wear foreign-made cloths, but homespun. Ask a Chinaman why this is, and he tells you that the poor wear suits of native cotton, because such clothing lasts three, four, or five times as

long as foreign cloth, because it tears less easily, and because it is much warmer in winter. Warmer because, he says, the yarn of which the native fabric is made is quite different from the foreign, and warmer by nature. While, therefore, the well-to-do merchant is wearing out three or four suits of handsomely finished *yang-pu*, the mechanic, the fieldhand, the porter, and the boatman are, and must be, content with one suit of coarser, but, in fact, better material. Whether it is possible for us to manufacture fabrics as warm, as lasting, and as tough as the Chinese can weave for themselves, and further, whether it is possible it can be made profitable, I do not pretend to say. But with a prize so immense and not yet shown to be made unattainable, every effort would seem worth making by the interests concerned, even that of sending out to this country some one possessed of technical knowledge, who could study the conditions on the spot, and observe, ask, and learn for himself." A very valuable hint indeed, for which our manufacturers should be grateful.

The German Textile Industry.

We learn from Leipzig, concerning the textile industry, that several surprising novelties have made their appearance. The ribbed silk goods, whether they appear under the name of Bengalese, Faille française, or "coarse duchess," are all covered with tiny roses, woven into the main part of the fabric. These patterns serve to show that, for the coming designs, preference will have to be given in every way to those having relief effects. The new Lyon materials have again discarded the various cross patterns, although it may not be said that these have disappeared entirely from the market and that they are not much in demand, as they are admirably adapted for some young ladies, but they are only manufactured by firms who work for a large consumption, rather than for any particular taste. For Jacquards and brocades, flowers form as yet the principal designs, in spite of attempts to order otherwise. It is scarcely necessary to add, considering the unlimited vagaries of fashion, that these flower patterns are diversified as much as they possibly can be. Besides these large patterns, there is a number of small ones; as well as diminutive roses mentioned above, we find liliputian violets, pansies, &c., decorating the main fabric. Frequently this effect is produced on velvet, and one can easily imagine the charming appearance the pansies would give to this material. The great industries will now naturally be fully occupied with these various patterns, and we certainly think that, for example, heliotrope coloured cashmeres with inwoven miniature silken pansies, (where possible attached to the silk), give an excellent design for autumn stuffs, which, while very pleasing to the eye and taste, are not excessively expensive. We have also to deal with some novelties destined for the summer season, there is for instance the so-called "Russian" linen, a sort of silk stuff decorated with stripes and figures, imitating embroidery patterns, and which has been officially prescribed by the Russians for blouses. There is a great number of mixed red and blue colours, nearly allied to each other after the Greek style. Large patterns, after the Greek, in the form of broad stripes, are generally in vogue. We see these patterns in the bright red and light violet summer fabrics, cambric, and often in the new light or transparent textures; woollen lace stuffs also show these large Greek patterns. Transparent, and also English embroidery, formed the highest novelty last year for light cambrics, muslin, and similar fabrics.—*Kuhlow's Review*.

The Society of Arts are prepared to award two gold and four silver medals for prime motors, of less than twenty-horse power, and suitable for electric-light installations. The motors may be worked by steam, gas, or other power. The medals will be awarded on the results of practical tests, which will be carried out under the direction of three judges appointed by the Council of the Society of Arts. The competition will take place in London about May or June next, and entries must be made before the end of February. The points of merit considered of the greatest importance are (a) regularity of speed as to revolutions per minute under varying loads; (b) regularity of speed during the various parts of one revolution; (c) power of automatically varying speed to suit arc lights; (d) noiselessness; (e) first cost; (f) cost of running; (g) cost of maintenance.



ORIGINAL DESIGNS.

There is no doubt that many manufacturers will prepare special designs for various fabrics in commemoration of the Queen's Jubilee, and we, therefore, have pleasure in giving, on our first and second plates, a Jubilee Table Cover; the body pattern is on the first, and the border pattern on the second plate. The objects shown on the former are the Arms of England, Scotland, and Ireland, upon separate shields, and the rose, shamrock, and thistle. In the border, the chief object is the Royal Arms. This design would look very effective if carefully worked in suitable colours, such as the following:—Black, Indian Red, Dull Blue, Brown, and Buff. By this combination an heraldic effect may be obtained. This design has been drawn by Mr. R. Lord, 97, Park Road, Bradford.

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Our third plate contains a design for a Printed Blind, also drawn by Mr. R. Lord.



Wool.—During December, the demand for wool has only been for actual requirements, and, as stock-taking has been in full run, the quantity needed has been small. Colonial wools have further reduced in price, with slow sales, whilst English have kept moderately firm. Stocks are generally held for firm rates, the prevalent opinion being that wools will not recede much in price and may possibly advance slightly with the new year. Yarn spinners and piece goods manufacturers are well employed on old orders; new ones have only come in sparingly—this being generally the case at the close of the year, it counts but little as to the actual state of business. The prospects for the year 1887 are hopeful, and expectations of a large trade seem to be borne out by the numerous inquiries to hand. During 1886, spinners and manufacturers have had a fairly prosperous trade as far as the quantity of goods sold is concerned, but they make general complaint of the meagreness of profits, owing to the excessive competition in every department. Those who have been most successful have produced new goods of a novel character.

Woollen.—This branch keeps very busy. Full time is the rule, and numbers of large firms are running their works overtime. The fancy worsted branches still take the lead both in demand, in proportion to the looms engaged, and in the excellence of the fabrics produced. Season after season, choicer materials are being put upon the market, which, in point of design, colour and finish, seem to leave nothing to be desired, but still, the next season, superior goods come into the market. The medium classes of woollens, have not the demand that the finer and lower descriptions meet, and makers of the former are not so busy as of the latter. In the heavier makes of cloth for overcoatings, the recent severe weather has had a salutary effect, and has moved large stocks of goods off the market, and thus put manufacturers of this class of materials in a better position for producing next season's fabrics. On the whole, the woollen trade is in a very satisfactory condition, the prospects of abundance of work for some months to come is apparent on every side. Prices are not such as producers desire, but still they are much better than in any other branch of the textile industry.

Cotton.—During the last month, the demand for the raw material has been below the average, owing to it being the close of the year, and stock-taking time. The yarn and piece branches have also been more or less affected through the same cause, still, for the time of the year, trade in these departments has looked healthier than during the same period of 1885. The demand for yarns and cloths is expected to be satisfactory

for some time to come, judging by the opinions expressed in the cotton districts by those intimately acquainted with the various branches. The home trade has, in many respects, improved recently, and the export branches are generally in a better condition than for some months back.

Linen.—This branch has been in an unsatisfactory state during the past month, and the prospects for the future are not hopeful. Damasks and drills have sold moderately well, as well as towellings, but prices have been against producers; for other classes of goods the demand has been meagre. Hemp and flax have not shown signs of improvement, and rates have had a weakening tendency. The production of yarns continues ahead of the consumption, consequently stocks on hand have accumulated considerably. The jute trade has been about as last report, and, on the whole, of a very satisfactory character. Prices keep moderately firm. The outlook is cheerful.

Lace.—Depression keeps a hold upon nearly all departments of the lace trade. The continued disputes about wages, and the severe competition by the Continental manufacturers, put a drag upon the industry that it is found impossible to move. The curtain branch, although moderately employed, is almost profitless, and the same may be said of the production of other classes of goods. The hosiery trade has improved slightly, and prices are moderately firm.

Cotton Industry in Germany.

Reports on the condition of the cotton industry in England and in Germany, says the *Cologne Gazette*, indicate a certain difference in the relative positions which is unfavourable to the German spinning industry. The past year has been a very bad one for the German industry in question, and the New Year has begun with very little improvement in the relation of prices, although the demand for the weaving and hosiery mills is active on the whole, and the stocks held by spinners are not large. Under these circumstances, our Cologne contemporary urges, an appeal which has been lately made for an Association of German Cotton Spinners deserves the more consideration as such combinations in other branches of industry have had, the Cologne paper believes, satisfactory results during the year which has just closed. As an illustration, the Siegerland Spiegel-eisen Association is mentioned, the members of which have been enabled during the worst period of the depression to obtain remunerative prices for their product from the iron-rolling works. As the number of German cotton-spinners is, comparatively speaking, not large, an understanding ought to be arrived at with little difficulty, it is contended. With "good feeling and some mutual consideration," satisfactory results ought to be attained. The understanding which has been arrived at between the Bremen Cotton Exchange and the German cotton-spinners, for the development of the Bremen market for the raw material, of which we gave an account some time ago, is alluded to as an example of what may be done by the cotton-spinners in regard to common action. Though it is incidentally admitted that the differences in the rates of freight from many places to Bremen and rival ports still leave much to be desired before Bremen can become the important cotton market for the supply of German spinners, which it is the object of the combination of the Bremen cotton merchants and the cotton spinners to make it, there is, nevertheless, said to be already a prospect of a steady development of Bremen cotton business. Combined action in cotton-buying has not been without profit to the participators, and a combination of the spinners, with the object of bringing about a moderate advance of yarn prices would, the *Cologne Gazette* argues, by enabling the cotton spinners to again obtain adequate profits, be beneficial to a very important branch of German industry. This confession of weakness, in spite of the protective tariff bill of 1879, which was to work such wonders for German "national" industry in general, and the German cotton-spinning industry in particular, is extremely significant.

The offices of the Imperial Institute of the United Kingdom, the Colonies, and India, have been established at No. 1, Adam Street, Adelphi, W.C. All communications for Sir Frederick Abel, C.B., the organising secretary, should be addressed as above.



BODY FOR JUBILEE TABLE COVER

THE JOURNAL OF PARKS AND RECREATION

Volume 1, 1931

Published by the U.S. Forest Service



NUMBER FOR JULY, 1931 COVER







TO OUR READERS.

The attention of our readers is drawn to the particulars of a new feature, in connection with our designs, which will be found on first page.

Woollen Suiting or Ulster Cloth.

No. 421.

Warp:—

8 Drab White self twist, 2/18 skeins woollen.
7 Black " " " "
1 Black twisted on Green Olive, and Green twist.
8 Drab White self twist, 2/18's skeins woollen.
7 Green Olive.
1 Black twisted on White and Crimson twist.

Woven:—8 White self twist, 2/18 skeins woollen.
 1 Black twisted on White and Crimson twist.
 7 Black self twist, 2/18 skeins woollen.
 8 White " " " "
 1 Black twisted on White and Crimson twist.
 7 Brown self twist, 2/18 skeins woollen.

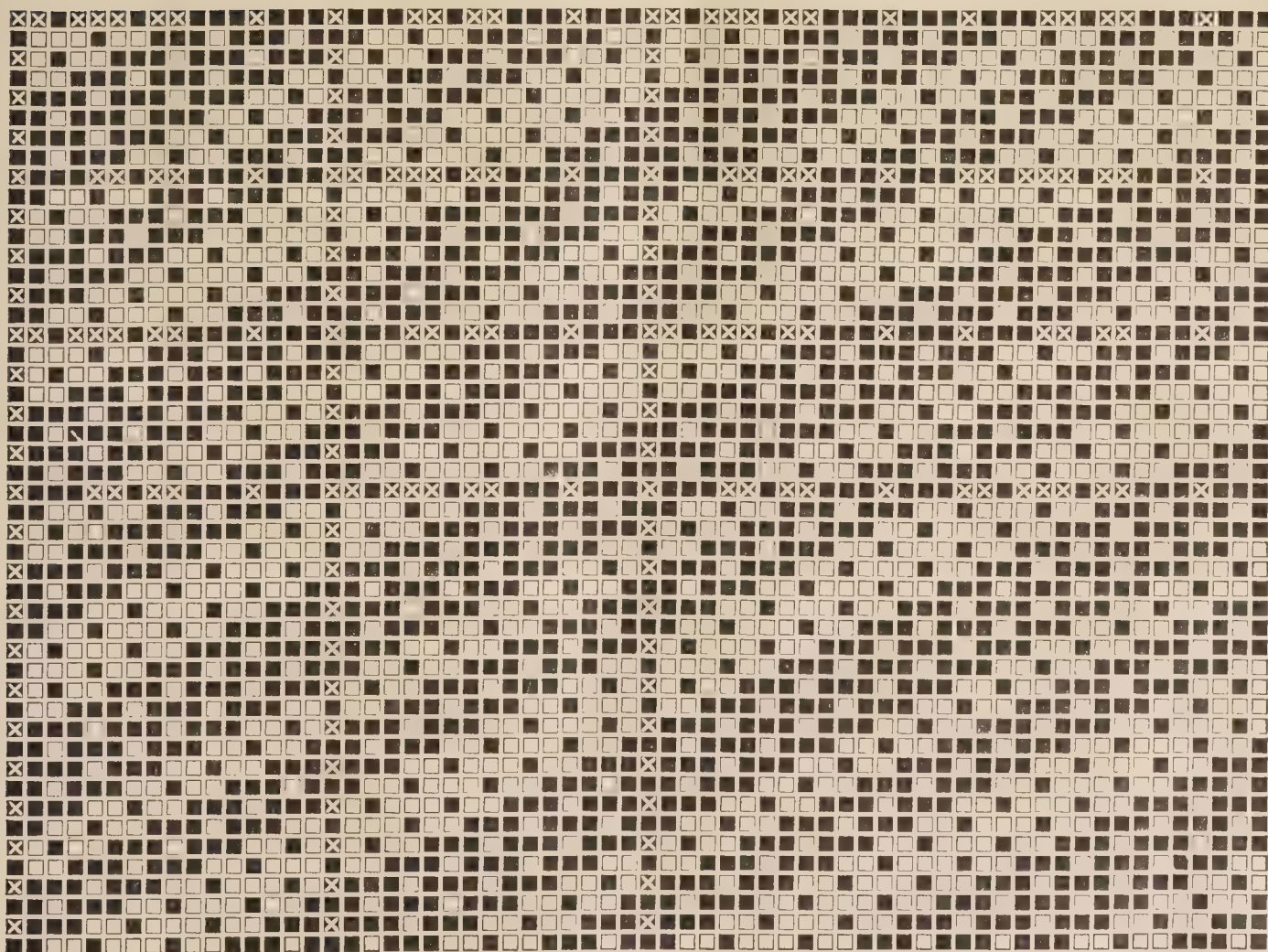
1,584 ends. Straight Draft.
 24 ends per inch.
 24 picks " "
 2 ends in a reed.
 8 healds.
 12's slay.
 66 in. wide in the loom.
 56 " " when finished.

Finish soft and mellow.

Weight 24 ozs.

Diagonal and Check Worsted Coating.

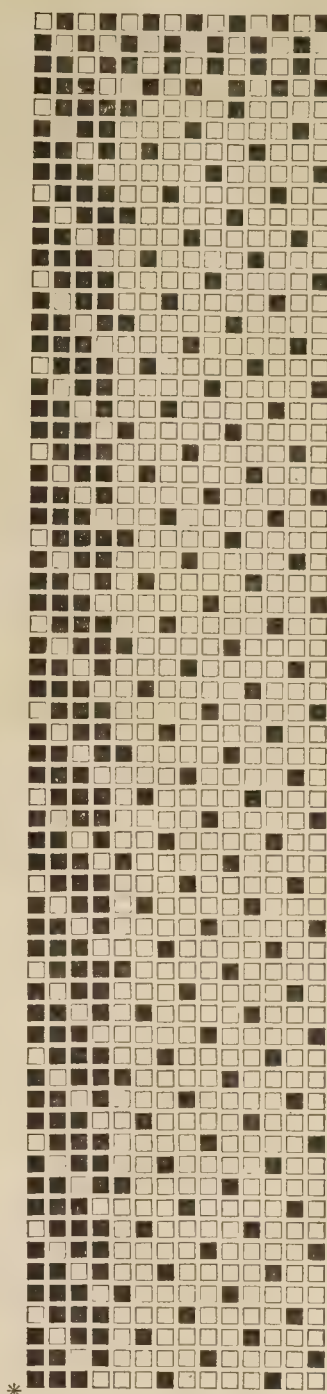
No. 422.



Design.

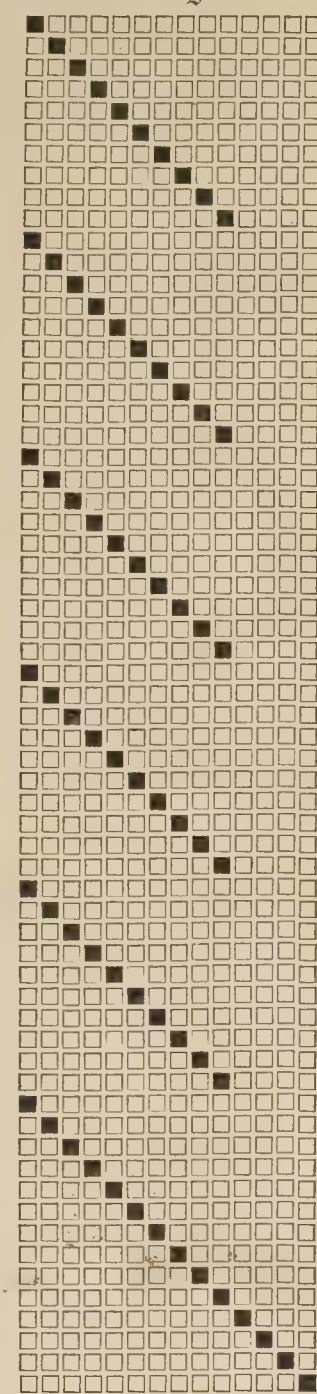
No. 423.

Overcoating.



Design.

Draft.



Warp:—
 29 Dark Green, 24 skeins woollen.
 2 Brown " "
 33 Dark Green " "
 24 ozs. to the yard.

Woven:—
 29 Grey woollen, 24 skeins.
 2 Brown " "
 33 Grey " "
 Soft velvet finish.

4,096 ends.
 64 ends per inch.
 60 picks " "
 4 ends in a reed.
 16's slay.
 64 inches wide in the loom.
 56 " " when finished.

The following are particulars for the Diagonal and Check Worsted Coating, which we have been asked by one of our Subscribers to dissect and publish:—

Warp:—

1 White silk and 15 worsted.
 1 " " "
 1 " 31 " "

Weft:—

23 picks worsted and 1 pick silk.
 7 " " "
 7 " " "
 7 " " "

80 ends per inch.
 60 picks " "
 2/32's worsted warp and weft.
 2/40's silk " "

The crosses X stand for silk.



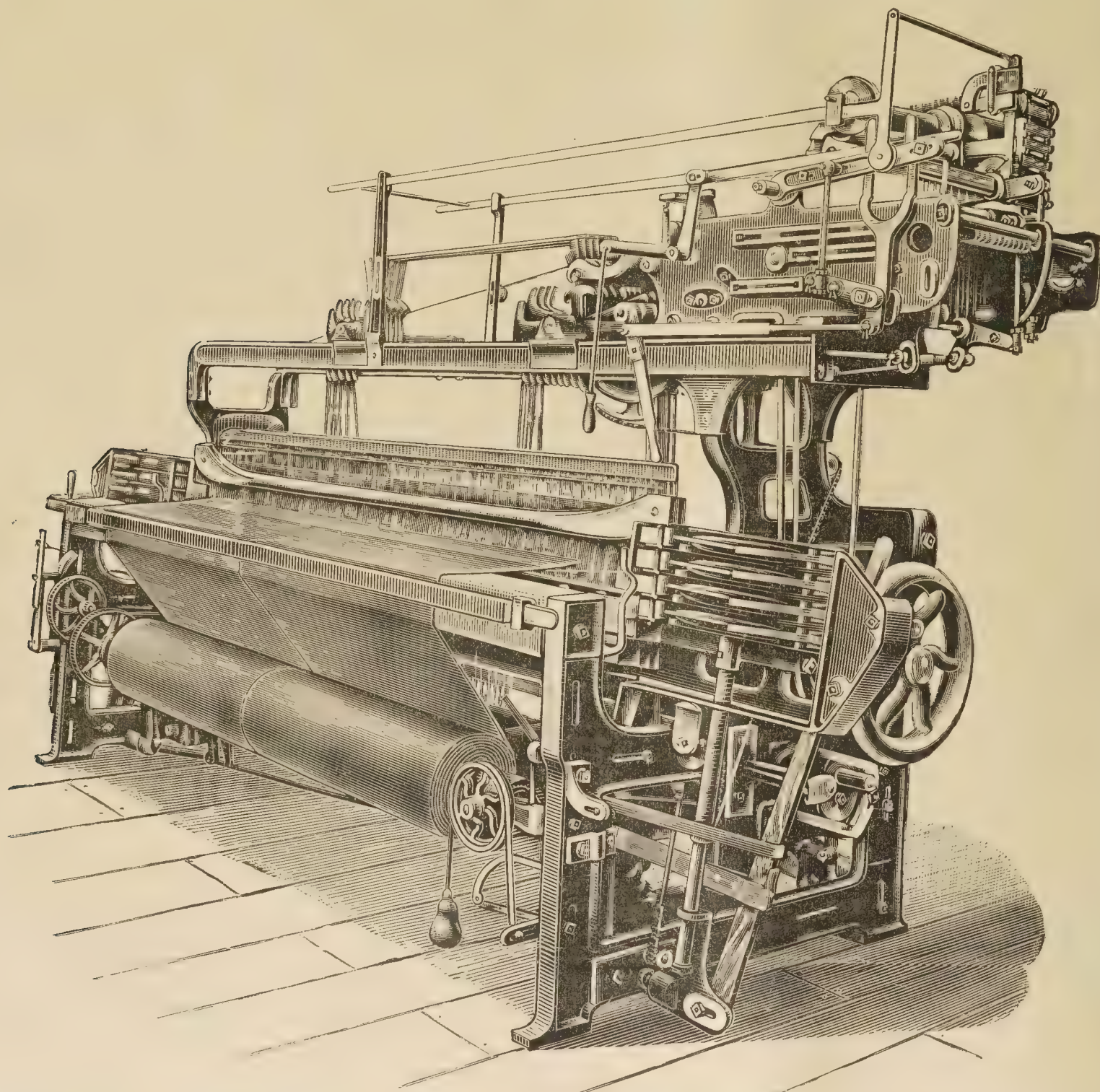
MACHINERY & TOOLS, & C.

Messrs. Pearson and Spurr, Limited, Patent

Box Under-Pick Loom.

Continual improvements are, from time to time, being made in the construction of looms for the weaving of woollen and worsted cloths, in which the advantages claimed by the makers are of a varied character. Recently

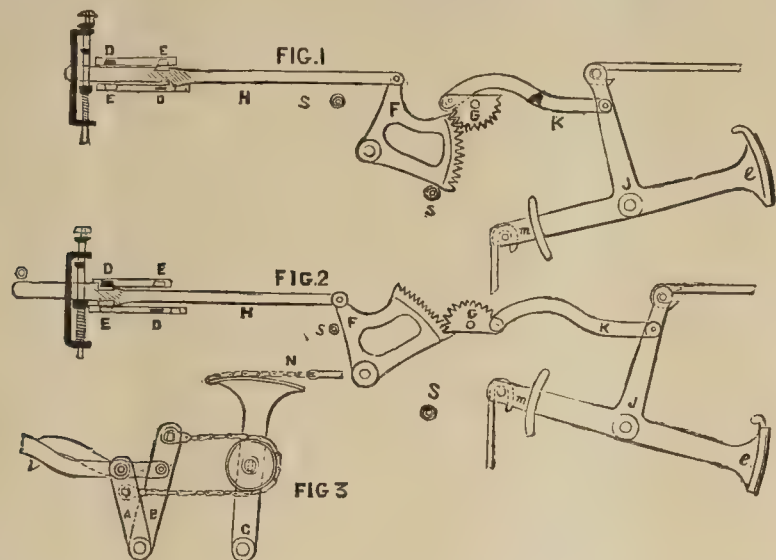
the manner in which the reciprocatory bars D communicate motion to the crank plates G, through the hooked rods H, and toothed plates F; then by the connector rods K, to the three-ended levers J; to one end of which *e*, the healds are suspended and connected from the end *m*, to the under side of heald shafts by means of rods and levers. The lever A in Fig. 3 is shown in its position after having been operated upon by a crank plate, and by that means has moved the lever C sufficiently far to raise the boxes one lift through the chain and rod N. The lever B, when operated upon by a crank plate, moves the lever C sufficiently to raise the boxes two lifts, and when both A and B are operated upon by the crank plates together, they move the lever C sufficiently to raise the boxes three lifts, or to bring up the bottom box of a 4-box loom level with the shuttle race or slayboard. The connector rods K are attached to the plates G by rivets; but the hooked rods H and toothed plates F, also the other ends of connector rod K, are connected by the well-known jack joint made by this firm. The rods, levers, and plates shown (Figs. 1 and 2) can be made any thickness required up to the thickness of the healds. The space allowed for each harness is $\frac{3}{8}$ -inch in looms with 24 or more healds; consequently all the parts, which are guaranteed of the best cast malleable iron, are of great strength and durability. The pattern chain changes when the healds are open and at rest. The chain is made with the ordinary peg lags and pegs. The pegs cannot possibly drop out of the lags, nor can a wrong move take place in the healds, boxes or pick, through unequal length in the pegs. The healds, boxes and



the call has been for looms for broad fabrics, in which a greater speed is a special feature, with an improved class of work, and these advantages have been successfully attained by the introduction of a new loom, patented by Messrs. Pearson and Spurr, Limited, of Birstall, near Leeds. This loom, an illustration of which is given, is a 4-box under-pick, adapted to weave heavy or light, fancy or plain, cloths of any description, up to 18 inches wide, at a speed of from 80 to 90 picks per minute, with shuttles carrying 7-inch bobbins or cops, $1\frac{1}{8}$ -inch thick, and having 24 harnesses, heald shafts or heddles. The annexed illustrations give detailed particulars of the improvements. The healds are worked on the open shed principle, that is, they remain stationary, up or down, until required to change. The change is effected by *one* movement, as in the tappet or cam loom, instead of by *two*, as in the close shed arrangement. The saving of time thus effected in the change, combined with the steady and easy action given to the healds and boxes by the eccentric or crank movement of the toothed crank plates G, shown in Figs. 1 and 2, enables the loom to be run at a great speed. Figs. 1 and 2 show

pick are moved positively each way. The boxes at each end are worked independently of each other, thus allowing seven shuttles to be used conveniently. The healds are fully open before the shuttle starts from the box, and remain so until the shuttle is finally settled in the opposite box. The lost pick or broken filling is readily found either by lagging back by hand, or by moving the reversing handle, which causes the pattern chains to move backward, leaving the pickers stationary, so that the weavers can confine their attention entirely to finding the broken filling; and when this is found, the boxes cannot be otherwise than in their proper position, ready for the adjusting of the shuttles. The harness, box and pick chains are upon the same cylinder shafts, consequently the shed, boxes and pick, cannot possibly get out of their proper relative position. When the bottom boxes are up, any or all of the shuttles can be changed without moving the boxes. The cone pick is used, but only one cone and one tappet, which pick the shuttle from each end according to the pegging plan, and cannot possibly pick from both ends together. The cone and tappet are fixed, or

non-sliding. The speed of the loom can be altered in a few minutes by means of change wheels. It will be readily perceived, by those versed in the mechanism of looms, that the advantages of this are of a superior



character, and such as to warrant the notice of every manufacturer of woollen or worsted cloths. The looms can be seen weaving at Messrs. Pearson and Spurr's works at Birstall, and the advantages claimed can be tested.

A New Screw Gill Preparing Box for Wool, Silk, Flax, &c.

A new screw gill preparing box, which threatens to supersede entirely the ordinary pattern of gill boxes for preparing wool, silk, flax, or other fibres used in textile manufacture, is being now put on the market by Messrs. Shaw, Harrison and Co., Birkland Street, Leeds Road, Bradford. The machines, which are to be seen at their works, are for dealing with wool only, but the principle is already being applied to silk, and is, as stated, applicable to "preparing" any kind of fibre. In the ordinary gill box, the wool, on entering the machine, is forcibly held in the nip of a pair of fluted rollers, tightly compressed by powerful springs. In the same manner the wool is drawn by similar rollers at the other end of the machinery, and in the travel of 18 inches or so of the fallers the wool is draughted by these rollers. In the new preparing box, this powerful nip and forcible draught are entirely dispensed with, and the draughting is accomplished entirely by the fallers themselves. This is attained by an entirely novel device. The ordinary screw, with a regular pitch which traverses the fallers at a uniform speed, is superseded by a much longer screw, with an ever increasing pitch, so that the speed at which each faller travels is constantly increasing from the moment it rises until it falls; and as the speed of traverse increases, so also, of course, the distance between one faller and another is also increased. To make this, if possible, a little more clear, let the reader suppose that twelve fallers are up at the same time. The two fallers nearest to the feeding end of the machine will be, perhaps, $\frac{1}{2}$ in. apart, the interval between the second and third will be $\frac{3}{4}$ in. between the third and fourth $1\frac{1}{4}$ in., from the fourth to the fifth 2 in., and so on. These are exaggerations, but they may serve to illustrate the meaning. The effect is, of course, very similar to that obtained in the combing machine. The wool is gradually drawn out with the fibres in one direction, but without any tendency to break the staple, because it is never held fast by the rollers. Instead of one screw for the fallers, two are used, the second screw being provided with finer combs. In two screws, with a total length of 42 in., the gain in speed thus accomplished is as $12\frac{1}{2}$ to 1. As to the results obtained it is, of course, not for us to speak, but the machines we saw at work have been engaged for some time past in preparing mohair and wool for several large and well-known firms in Bradford, who have expressed themselves as more than satisfied with the output. It is claimed that, as there can be no breaking of the staple, there is a considerably greater yield of top, of better quality, and with a corresponding decrease of noil. Incidentally, the machine also offers many other advantages, such as the saving in leather aprons, and the breakage of pins, the smaller driving power required, and facility for repairs, &c. The patents for the cutting of the screws, which is the essence of the machine, have been taken out by Messrs. Douglas and Shaw, of Bradford, and the patentees have given to this screw the title of "Sensim."

The Future of the Lancashire Cotton Industry.

In the sketch of the "British Cotton Industry," by Mr. J. C. Fielden, the writer, deals with the past, present, and the probable future of the industry. In considering the present condition of the trade, Mr. Fielden tells us that punctuality, regularity, and continuity of work are the essence of the factory system. He points out that, when machinery is idle, the expenses of working continue the same on a lessened production, and he attributes the gradual movement of the actual processes of the cotton manufacture away from Manchester, the great commercial centre of the industry, less to the lower cost of land in the surrounding towns and villages, than to the fact that a steadier supply of female labour is likely to be available there than in a great city. Manchester, however, really does great service to the local cotton industry, and is itself one of the advantages which tend to retain the industry in Lancashire, because of the high development of its commercial system, and the fact that its merchants have representatives and branch houses established in all parts of the world. The very magnitude of the industry in Lancashire, the great variety of fabrics which are produced in enormous quantities, and the endless series of subsidiary industries, also highly organised, make our position almost impregnable. In any case, it would take long for any rival country to develop a system which has been the growth of a century at least; favoured by priority, many specially suitable conditions, and constantly accumulating wealth, and a full exertion of our strength, would enable us almost to swamp any rival industries during the period necessary for their growth. In brief, apart from all special conditions, we have the advantage of an enormous start in the race. Amongst the peculiar natural advantages we possess, are those of compactness and geographical position, which no foreign competition can alter. The distance between the centres of production in the United States, for instance, is itself a difficulty. Though the Americans grow their own cotton, it can be sent here almost as readily and cheaply as to their own widely severed mills; and the various descriptions, other than American, required for mixing, such as Indian and Egyptian cotton, reach us so much more readily than they can reach the United States, that the advantages of supply are, on the whole, rather with us than with them. Incidentally, however, Mr. Fielden urges the desirableness of the development of these other sources of supply, and noticeably India, so that we may not be too greatly dependent on the American crop, a lesson which the cotton famine of the American War period powerfully enforced. Beyond the, perhaps, doubtful question of supply, our competitors, even in America, have no advantage. Our climate is better suited for weaving than that of any other country in the world. Amongst the primary conditions for the successful competition of country against country in trade, Mr. Fielden enumerates settled government, with security for life, property, and enterprise; cheap capital, and an industrious, orderly, thrifty and intelligent population; inventive and mechanical skill; commercial skill, enterprising merchants, and well organised industries; an advantageous geographical position; a population essentially fitted to do an ocean-carrying trade; and, finally, labour working under sound arrangements, securing comforts and contentment, and thereby capable of yielding the most effective work. In regard to none of these conditions are we behind other nations; while taking them in bulk, we unquestionably occupy the first place. Mr. Fielden maintains, however, that the skill and quality of our labour are by far the greatest in importance, and, therefore, that the continuance of good relations between employers and employed is vital. He pithily observes that our advantageous position cannot be lost, but that it may be destroyed. Mr. Fielden has little difficulty in dealing with the statistics on which the contention that we have entered on a period of decadence has been based. It has often been pointed out that, in the arguments deduced from the recent statistics of the cotton trade, the influence of the variations of prices, and of the relative fineness of the spinning, and the degree of finish of the product are not taken into account. Comparisons of the mere value of our exports, from year to year, afford no criterion as to the activity of our industries in given years, and tables merely showing a greater proportionate increase in the quantity of raw cotton consumed in other countries, provided always that our own consumption continues to increase, are equally fallacious. A pound of cotton, observes Mr. Fielden, may be worked up so as to give only two-pennyworth of employment, or so as to give forty or fifty times as much. As the average fineness of our yarn and cloth production is at least twice that of other countries, Switzerland alone excepted, a growth of 303,000,000 lbs. in our annual cotton consumption between 1870 and 1880, was really far more important than a growth of 431,000,000 lbs. in the annual consumption of the United States within the same period. But when, in addition, the already enormous development of our cotton industry in the former year is taken into account, its continued further development must be regarded as a very remarkable proof of vitality, because, the larger an industry is, the nearer it might be supposed to be to its possible maximum expansion. An important point which Mr. Fielden makes is that the protective tariffs of foreign countries have forced us to the production of finer and better classes of goods, and, therefore, have not tended to degrade our labour, as Mr. Ecroyd and the Fair-traders have alleged. We had occasion some time ago to point out that this is true of many other branches of industry as well as of the cotton trade;

whereas, under Protection, the labour of our rivals is distinctly being degraded. In considering the future, Mr. Fielden points out that no nation has yet shown a capacity to meet us on equal terms in neutral markets, unless it be India, in the production of coarse goods. Mr. Fielden has identified himself with the bimetallist movement, and he takes the opportunity to insist that India will only be an exception so long as silver is depreciated in terms of gold. As for the danger of the cotton trade being "overdone" he refers to a letter written in 1821, in which the trade was said to be "overdone" with only a thirtieth part of the power-looms now in this country. A safer argument is the statement that two thirds of the world's population live in hot climates, and that, if the consumption of cotton goods per head throughout the world were no higher than in England, where woollens are an absolutely necessary article of clothing, the world would consume cotton goods to the value of £800,000,000 per annum instead of £350,000,000, the value of the present production. There is, therefore, a wide margin for increased production before the world is properly clothed, and, meanwhile, population is also increasing. With progress and prosperity in India alone, there is a field for an almost indefinite expansion in the consumption of cotton goods. China is another potential market of enormous consuming capacity, to say nothing of Africa and the newly opened regions of North and South America. Mr. Fielden balances manufacturing against agricultural industry, and, with the development of countries like Canada and Australia as food producers, he foresees a corresponding increase in the demand for cotton goods. It cannot be said that Mr. Fielden has over-stated the hopeful features of the case in his thoughtful and interesting article; and in laying emphasis on the importance of a continuance of good relations between capital and labour as ensuring a continued and prosperous future for the Lancashire cotton trade, he has undoubtedly placed his finger on the *desideratum* most worthy of careful consideration. The increasing share of the workpeople in the capital of the industry, exemplified in the case of the Oldham "Limiteds," is also rightly referred to as a very noteworthy illustration of the gradual evolution of conditions likely to guarantee such good relations, and to place the operative in a position the very opposite of that occupied by his class during the early part of the century, and not inferior to that of his farming and handloom-weaving progenitors of a more remote period.

Reports of H. B. Majesty's Consuls.

AFRICA (EAST COAST).—A report on the trade of Aden, with special reference to that of the Somali coast on the east side of Africa, by Captain Snell, the assistant political resident in-charge of the Trade Registration Department at Aden, has just been published. Captain Snell tells us that grey American shirtings are the foreign fabrics most largely imported into Aden, and that these fabrics are much appreciated not only by the Arabs of Yemen, but by the Somalis. The imitation so-called "Country American" goods, produced in the Bombay mills, have been rejected as very unequal in finish and durability to the real article. Captain Snell gives details as to the length, breadth, prices, mode of packing, and so on, of the American goods referred to. During the year 1885-6, 5,249,612 yards were imported, against 3,559,695 yards in 1884-5, so that the trade is evidently an increasing one. To the east coast of Africa, in 1885-6, 2,744,395 yards were exported from Aden, against 1,991,367 yards in 1884-5. Captain Snell says that there can be no doubt that there is a fine field for Lancashire cotton goods in the Somali country, north of the territory of the Sultan of Zanzibar; but, he adds, that Lancashire must be careful to ship only goods of a comparatively high standard, as the natives have been thoroughly educated up to a knowledge of the goods, and prefer the more durable qualities. There is a trade in beads also, supplied chiefly from Venice and Trieste. Turkey-red goods have been superseded by a cheap imitation produced in Germany from aniline dyed yarns, and received at Aden *via* Trieste. In this case, the natives appear to appreciate cheapness rather than quality. Dyed yarns of European production are obtained largely from Bombay. Captain Snell recommends the establishment of a sample-room at the Trade Registration Office as being likely to promote British trade. He calls attention to the paucity of British merchants in the settlement; and Mr. Sealy, the British acting consul, adds that of eleven foreign consuls or consular agents established there, only one (the French) is unconnected with trade. Goods pass through three sets of middlemen after arriving at Aden before reaching the consumer. Captain Snell will be glad to furnish information on one specified day in each week to the local tradesmen and others wishing to communicate with the British manufacturer. There are public letter-writers in connection with his department, so that there need be no difficulty about the correspondence; and the Bank of Aden would furnish the necessary drafts for cash transactions. He suggests also that packages might, under certain conditions, be forwarded through the agency of his department. For a year past, a steamer has been regularly running between Aden and the Somali coast ports, and the rapidity with which goods can now be conveyed ought greatly to facilitate trade with the caravans which come from the interior of Africa. A map, showing the centres of British trade in the neighbourhood of Aden, accompanies the report.

FLORENCE.—Consul-General Colnaghi, in his notes on the use of foreign machinery in the mills of Movaria, points out that the district contains about 100 woollen factories, in which raw wool and shoddy are worked up into textiles of various qualities, employment being given to some 12,000 hands, with a total of 2,500 hand-looms in the factories and at home, and 900 power-looms; 31 cotton factories, for weaving only, maintain 3,750 hands, with some 2,200 power-looms and 1,020 hand-looms. There are twelve factories of cotton, woollen, and mixed knitted goods, giving employment to about 700 or more hands. The condition of the woollen industry is, on the whole, prosperous; and the recent rise in the price of wool has given a fresh impulse to the production. In the manufacture of cotton, there appears to be a crisis, perhaps in part caused by over-production; and the mills were, generally, working without profit. The industry of knitted goods seems to be on the increase. As regards the spinning machinery of all kinds erected in the mill, British makers still bear the palm, but, on the contrary, there are very few English looms at work in the district as regards weaving machines. The carding machines appear to be principally supplied by Belgian firms. In the knitted goods factories, the circular machines are of French and German manufacture, whilst a few horizontal machines are of Leicester and Nottingham production. Mr. Colnaghi concludes his preliminary notes by saying that a manufacturer told him the following:—"We are inundated with circulars from English houses, which are perfectly useless to us, but we very rarely see an English traveller; German travellers, on the other hand, are frequent. They bring samples of portable articles, give explanations, are anxious to meet the wants of their clients in every way, and, as a consequence, do business. Should any English firms who have not hitherto done so, think it worth while to send out travellers to Italy, their agents must be well acquainted with the Italian language. They must also be men of considerable business tact, for their dealings will lie with shrewd and long-headed manufacturers who know their business, and are keenly alive to their own interests."

IMPEDIMENTS TO BRITISH TRADE EXTENSION.—The inexpensive way in which foreigners live, says Captain F. W. Snell, of Aden, compared to the ostentation displayed by British merchants in the East, has often enabled the former to tide over the many difficulties that always have to be contended with before a connection is established, and the confidence of the native and other traders has been gained. Higher freight to the United Kingdom than to the Mediterranean, commission on produce bought, agents' shipping and landing charges, both at Aden and the port of discharge, &c., are all items that go towards swelling the price of an article, and towards making it almost prohibitive to the British merchant, who has not a representative established at Aden with a vested interest in the business. Captain Snell also remarks that the Suez canal has altered many branches of trade, "and England is no longer the entrepôt for the produce required by the greater part of the civilised world."

Mr. Consul Gardner, of Hankow, submits 44 samples of native cottons and a report, the former having been lodged with the Manchester Chamber. Some small packages of native thread and tapes, and a few linen textiles produced from the same plant, that is manufactured into rhea fibre, are also included in the collection. Unbleached white cotton cloths are used universally in mourning, and during a week each year on the ceremony of worshipping at the tombs of ancestors, by, the Consul believes, the whole of the Chinese population. Others use white for working clothes, and white cloth is largely used for sails, awnings over hucksters' stalls, covers to umbrellas, &c. Bleached white cloths are used throughout China as underclothing in winter, for making socks, and for the thick soles of boots and shoes—the soles of socks being made three or four-fold, and of boots and shoes up to one hundred fold. Indigo dyed cloths are the next most used, while most of the colours in the rainbow, and out of it, are brought into requisition for other purposes. One suggestion our Consul makes will, perhaps, receive more attention in view of the report issued by the Imperial Institute Committee, viz., that of establishing a commercial museum. Mr. Consul Gardner points, with pride, to the good results which have attended suggestions of the consuls in China when they have been followed up, and thinks greater extensions of trade would take place if the reports were properly perused.

AN EARLY REPORT FROM SAXONY.—Mr. Consul Strachey, of Dresden, brings his report on trade in Saxony up to the beginning of December, and dated on the 9th of last month, is already in our hands. Mr. Strachey remarks that a very marked upward movement in coal, iron, and machinery securities has been in process since November. The reports from the centres of production invariably state that prices had stiffened, and that buyers are less reserved, &c. It is understood that the International Rails Convention is likely to be renewed, and that it will be extended to France. Textiles have been fluctuating, but in "the battle of German and British machine sewing cotton" the British production is looked upon as more economical. Any depression under which the textile trade may be labouring bears more on prices than on orders, during the nine months of 1886, for which the returns are available, and a respectable advance over 1885 is discernible in foreign trade. Exports of iron and iron ware of all descriptions, worsted and woollens, silks and half-silks, linen and jute, with the exception of railway plates and coarse goods, have all increased; and in the imports, an augmentation is accredited to heavy cotton stuffs, hosiery, linen, made garments, and *passementerie*; also on lead, copper, and other

metals and wares; glass, stone goods, paper and its products, wooden wares, leather, and leather goods. Within Mr. Strachey's "local horizon" there appear to be present most of the tokens usually considered to be the signature of the advance of prosperity.

INFERIOR COTTON GOODS IN PERSIA, AND RUSSIAN ADVANCES.—Attention is called by Mr. Consul-General Abbott to the practice adopted by Armenian firms at Constantinople of importing from Manchester printed calicoes of inferior and unsound quality, and sending them for sale to the Tabreez market. As a result, Persians are beginning to use Russian textiles, but some time must elapse before Russia can succeed in driving Manchester goods out of the market. British manufacturers must, however, study the market, and, above all, provide only goods of sound quality if this contingency is to be obviated. Moscow manufactured goods are being gradually introduced into Persia, and becoming articles of more frequent purchase than formerly. Mr. Abbott has forwarded samples of unsound goods in proof of his assertion, and these have been placed in the hands of the Manchester Chamber of Commerce.

Book Notice.

THE MANUAL OF LUBRICATION, by LOUIS SIMPSON.
Manchester: J. Andrew & Co., 1, Warren Street.

This book, which has been written by a thoroughly practical man, for the guidance of those who have machinery of any description in use, ought to be in the hands of every one interested in lubricating compounds. The object of the work is—first, to give a brief description of the different oils now used for lubricating purposes, their properties and their action upon metals; secondly, to indicate what classes of oils are suitable for the economical and effective lubrication of the different kinds of bearings usually found in various establishments; thirdly, to notice the adulterants at present employed in order to pass off inferior oils for those of high quality, with the tests for the detection of these adulterations; fourthly, to inform oil users of some of the many new kinds of mineral hydro-carbon oils, which recent scientific discoveries and inventions have produced; and lastly, to give some information upon lubricators, and upon "Humbug" in the oil trade. The perusal of the work will yield, both to the practical and to the uninitiated reader some really sound information; and especially to those who are users of lubricating compounds, such information will be of great value in many ways. It would take up too much of our space to go thoroughly into the merits of the book, but we strongly advise our readers to purchase a copy, which is in a handy form, and published at the low price of 3s. 6d.

The Chinese and the Japanese Cotton Ginning Machines.

We extract the following from the report of Consul Cooper in the hope that it may attract the attention of some of our mechanical readers and lead to the production of an improved but simple machine suitable for cotton growing. Writing from Ning-Po, (China), and speaking of the cotton manufacture of the district and the apparatus in use for that purpose, the Consul says:—The ginning machine, to be found in every decent household, has two cylinders, 10 inches in length. The upper, an inch in diameter, of smooth iron, is worked by a pedal and crank. To the further end of it a narrow board is attached by its middle. The ends are weighted, so that it acts like a fly-wheel. The lower cylinder is slightly over 2 inches, and made of Mao-lieh wood, unsmoothed. This is a common tree; the leaf resembles that of an elm. Its peculiar surface catches the cotton fibres, while the proximity of the upper cylinder prevents the seed accompanying them. The lower cylinder is turned by one of the hands of the women sitting at the machine, while she feeds with the other. The Japanese one, lately introduced, is worked with one pedal by a man standing, and requires his full weight. The frame is of cast-iron, as is the fly-wheel. The principle is a wooden cylinder, 15 inches long, covered with tanned leather, scored diagonally, working against a smooth metal edge. The fibres are caught by the lips of the cuts, and are drawn through the crevice, leaving the seeds stripped. The operative, with both hands, supplies the feeder, which consists of prodding bars, between which the naked seeds fall. In some family residences the scutcher's bow, mallet, and bed, and the weaver's loom are to be found, and men (or women) who are skilled in their use. Scutchers and weavers, however, with their respective apparatus, can always be had for wages of 16c. (about 7d.), and two meals a day. If English machinists can furnish improvements on these simple contrivances at a low cost, an extensive market is

open for their inventions. By the indifference that has attended the introduction of the Japanese machine, that does the same amount of work that ten or twelve native ones could scarcely do, it may be argued there exists no prejudice against innovation to offend.

ODDS AND ENDS.

It has been decided to erect a Technical Institute in Dundee, near University College, to be carried on in connection with the College. The building is to be called "The Baxter Technical Institute," the late Sir David Baxter, of Kilmarnock, having bequeathed £20,000 for its erection, with a view to the improvement of working men in scientific knowledge.

In reply to a deputation from the London Chamber of Commerce, who called attention to various anomalies in postal rates, especially on letters to the Colonies, Mr. Raikes, Postmaster-General, states that he could not see his way to reduce the rates, on newspapers. Telegraphic charges could, he thought, be best reduced by competition, and the Government would be willing co-operators. He sympathised with the desire to reduce the book post rate, and the rate on patterns and samples.

American inquisitiveness and ingenuity united, says *The Boston Journal of Commerce*, have produced thread made from the blossom of the common milk weed, which has the consistency and tenacity of imported flax or linen thread, and is produced at a much less cost. The fibre is long, easily carded, and may be readily adapted to spinning upon an ordinary flax spinner. It has the smoothness and lustre of silk, rendering it valuable for sewing machine use. The weed is common throughout this country, but grows profusely at the south. The material costs nothing for cultivation, and the gathering is as cheaply done as cotton.

Captain Ericsson, the inventor of the Monitor, is stated, in scientific circles in New York, to have completed and brought into successful operation an engine which works by heat obtained from the sun's rays. The rays are focussed upon the boiler from a concave surface of looking-glass, eleven feet by sixteen in size, arranged in such a manner as to be constantly directed to the sun. Captain Ericsson declares that he is able to obtain by this contrivance a steam pressure of 35 pounds. The "Sun Engine" is of course, only applicable for use in tropical or sub-tropical climates. The inventor has been three years in perfecting this novel description of engine, and if it is found to justify the claims which are confidently made on its behalf, motive power in the East, at all events, will rapidly become much less costly than at present.

The main building now being constructed on the grounds of the American Exhibition of the arts, inventions, manufactures, resources, and products of the United States, at Earl's Court, Kensington, is entirely unique, and will in itself be a most interesting exhibit. The entire framework of the structure is composed of steel rails, such as are used in constructing railways. Two of these bolted back to back, with the T side out, make a very strong and really ornamental column. The only casting required is an angle iron and eyebar, into which the ends of the rails are slipped. This frame will then be covered with plates of glass and sheets of corrugated iron. The advantages are many. For rapidity of construction it is unequalled, as an acre a week can easily be put up, and it has also the advantage of economy, no skilled labour being required to put it up or take it down, and, when finished with, the material is as good and marketable as when first purchased. This invention, in fact, solves the problem of large temporary structures which can be quickly and cheaply built.

There has recently been opened in Toulouse (South of France) a permanent commercial and industrial exposition, or museum, similar in its character and object to the *Nederlandisches Handel's Museum* of Amsterdam. It is under the management of M. A. Detienne, director of the society, and under the patronage of the Chamber of Commerce of Toulouse, and the Agricultural Society of Haute-Garonne. The buildings formerly occupied by the College of St. Marie will be utilised for this purpose. There are to be four large rooms for exhibits, and a park for the display of out-door machinery; also an audience hall, in which public meetings will be held, and scientific experiments carried on. The museum will be open to the public every day in the year, and the society will publish a complete catalogue, and a monthly journal, *Le Musée Commerciale*, which will be devoted to the discussion and description of inventions and other exhibits of interest to the public. The directors will employ travelling agents, through whom information may be transmitted, and sales secured in southern France, for which sales the managers of the exposition will hold themselves responsible. The Institute will have relations with like institutions in England, Germany, Austria, Belgium and Italy.



Receiving Orders.

Opie, C. (trading as C. Opie and Co.), 39, Noble Street, London, manufacturer and commission agent, High Court of Justice in Bankruptcy.

Adjudications of Bankruptcy.

Hardy, C., 129, Noel Street, Nottingham, lace manufacturer.

Dividends.

Ellington, H. R., and Aldred, J. T. (trading as Ellington and Son), 13, Friday Street, London, and Glengall Wharfe, Old Kent Road, Surrey, manufacturers and warehousemen, 7s. (second), Trustee's Office, 99, Cheapside, London.

Frost, L., 55, Blossom Street, Manchester, silk manufacturer and finisher, &c., 1s. 6d. (first), Office of William Stavert, 1, Piccadilly, Manchester.

Forth, J. E., Carver's Factory, Ashforth Street, Nottingham, lace manufacturer, 2s. 6d. (first), 22, Low Pavement, Nottingham.

Dissolutions of Partnership.

Ackroyd, W., Hollings, T., and Hall, W., Bradford, Yorkshire, plush manufacturers.

Ambler, T., and Ambler, J., Atlas Mills, Bradford, worsted spinners.

Crabtree, J., and Hodgson, F., Bower Green Shed, Leeds Road, Bradford, worsted manufacturers.

Fenton, T. W., Fenton, W., Fenton, S., Batley Carr, near Dewsbury, Yorkshire, woollen cloth manufacturers.

Gee, J., and Pape, M., Quarmby Mills, Quarmby, near Huddersfield, cloth manufacturers.

Hinings, F., Hinings, J. B., and Hinings, G. W., Bradford, Yorkshire, stuff manufacturers and merchants.

Holroyd, W., Holroyd, G. F., and Holroyd, S., Parkside Road Mills, Bradford, stuff manufacturers.

Rice, H. W., and Dandison, W. F., Nottingham, lace manufacturers.

Stanley, W., and Metheringham, A., Chilwell, Nottingham, lace manufacturers.

Taylor, T. W., and Lodge, J. T., Victoria Mills, Lockwood, near Huddersfield, fancy woollen manufacturers.

Walker, M. A., and Wickens Marion, 20, Australian Avenue, London, lace merchants and manufacturers.

Wilson, J., and Wilson, W. C., Eastburn, near Crosshills, Kildwick, Yorkshire, worsted spinners.

Wilson, J., Barnett, W. D., and Edwards, J., 13, Addle Street, London, cotton manufacturers.

PATENTS.

Applications for Letters Patent.

Applying tension to weft thread bobbins for knitting machines. J. H. Cooper, W. J. Ford, W. M. Richards, and G. Blunt, Leicester.	29th Nov. 15,529
Applying friction or drag to warp beams. C. Fox and P. Crossley, London.	4th Dec. 15,839
An improved fabric. J. Booth, Halifax.	24th Dec. 16,897
Apparatus for rotating doffer and cylinder of a carding engine at a slow speed, whilst the doffer or doffer and cylinder is or are being ground.	30th Dec. 17,097
Belts and ropes for driving and other purposes. W. W. Oldfield, Glasgow.	29th Nov. 15,536
Box wheels used in calico printing, &c., machines. J. M. Hampson, Manchester.	1st Dec. 15,680
Breaking, beating and cleansing flax, hemp, &c. W. S. Johnston, Liverpool.	4th Dec. 15,895
Bobbin, &c, for preventing slipping of weft in weaving. J. Jepson and S. Wilkinson, Halifax.	11th Dec. 16,241
Breaking, opening, &c., flax, &c. F. G. Lange, London.	11th Dec. 16,276
Back beams or rollers of looms. D. Durkin and A. W. Beardsell, Manchester.	18th Dec. 16,623
Bands or belts. W. Withall, London.	23rd Dec. 16,886
Combing wool, &c. J. H. Whitehead, London.	30th Nov. 15,635
Carding cotton, &c. W. Tatham, London.	4th Dec. 15,889
Cleaning hackle pins in machines for hackling flax, &c. J. M. Greeves and T. Lucas, Belfast.	6th Dec. 15,918

Connecting pickers to the picking sticks of looms. G. and J. E. Jackson, Manchester.	14th Dec. 16,367
Carding Engines. J. Haley and S. Lebe, Halifax.	17th Dec. 16,561
Drying wool, &c. J. B. and W. Whiteley, Halifax.	30th Nov. 15,599
Driving belts or straps and fasteners. G. H. Smith and B. Cooper, London.	9th Dec. 16,121
Dobbies or shedding machines. J. Butterfield, Halifax.	13th Dec. 16,291
Drying dyed slivers of fibre. E. and G. E. Sutcliffe, Halifax.	15th Dec. 16,443
Dyeing hanks or skeins of textile material. C. Coron, London.	17th Dec. 16,596
Forks for guiding belts for transmitting power from pulley to pulley. W. Atkinson and E. Tattersall, Bradford.	26th Nov. 15,429
Figured cloth. D. Greenhalgh, London.	26th Nov. 15,437
Fastenings for uniting driving belts or bands, &c. T. Pearce, Birmingham.	2nd Dec. 15,747
Finishing textile fabrics. A. Glaister, London.	6th Dec. 15,934
Flax spinning. A. B. Wilson, Belfast.	9th Dec. 16,132
Forming undulated, corrugated, scalloped or vandyked edges in bed quilts, &c., and fringing the same. J. Kippax, Bolton.	10th Dec. 16,175
Figured fabrics and apparatus. T. Taylor and J. Warburton, Manchester.	13th Dec. 16,284
Flax scutching. A. MacLaine, Belfast.	15th Dec. 16,420
Jacquards and apparatus connected therewith. W. J. and A. P. Riley, Manchester.	30th Nov. 15,582
Jacquards. J. McMurdo, Manchester.	2nd Dec. 15,749
Jacks of looms. R. Curtis, Halifax.	29th Dec. 17,024
Looms. C. Catlow and J. Clayton, Halifax.	4th Dec. 15,857
Looms for weaving weft for chenille or fur pile fabrics. G. Morton, Glasgow.	11th Dec. 16,245
Looms in which pattern chains, cards, or the like are used for causing or controlling the action or inaction of any part or parts of the loom. J. Clegg, Manchester.	11th Dec. 16,254
Lace and other fabrics and means used to produce the same. W. Birks and J. Cropper, London.	15th Dec. 16,481
Looms. J. Jucker, Manchester.	28th Dec. 16,970
Looms. R. E. Lester and J. A. S. Biernatzki, London.	28th Dec. 16,973
Loom. A. M. Clark, London.	30th Dec. 17,094
Obtaining power for driving pulleys, &c. T. Bower, London.	6th Dec. 15,950
Operating the rising and falling shuttle boxes, and controlling the picking motion of looms. F. Leeming, Halifax.	9th Dec. 16,110
Printing in bronze, especially on plush. A. Finger and W. Menzel, London.	29th Nov. 15,555
Printing colours on hanks, yarns or pieces. C. Gaydet, London.	30th Nov. 15,641
Producing patterns on cut or uncut pile fabrics. E. Fuld and G. Tunnicliff, Huddersfield.	1st Dec. 15,677
Pirn or cop winding machines. G. Young, London.	8th Dec. 16,073
Pickers for looms. Messrs. Radcliffe and Mackay, Halifax.	18th Dec. 16,649
Reeds for looms. F. Baynes and J. P. Dixon, Manchester.	4th Dec. 15,864
Shuttles for looms. H. H. Illingworth, London.	3rd Dec. 15,806
Shuttle guards. S. Shore and W. May, Manchester.	9th Dec. 16,114
Shuttle guards. A. Hunerwadel, London.	11th Dec. 16,259
Stripping comb for use in machinery for preparing cotton, &c. R. S. Collinge, Manchester.	8th Dec. 16,061
Twisting and winding chenille or yarns or threads of various kinds. R. Boyd and F. Lepainteur, Glasgow.	26th Nov. 15,412
Twisting yarns. J. Morrison and E. Hargreaves, Halifax.	26th Nov. 15,413
Treating wool and other fibrous materials for removing burrs. A. Morel, Liverpool.	8th Dec. 16,066
Treatment of silk and other fibres. H. H. Lake, London.	14th Dec. 16,416
Uniting the ends of bands for pulleys. G. O. Wray, Bedford.	13th Dec. 16,335
Washing and scouring wool, &c. J. B. Whiteley and W. Whiteley, Halifax.	30th Nov. 15,600
Washing cotton, &c. G. Jagenburg, London.	30th Nov. 15,669
Weaving the end borders of towels, &c., and mechanism therefor. F. Morrison and E. Beveridge, Glasgow.	3rd Nov. 15,811
Wax-rods or rollers used in weaving. W. Parkinson, Manchester.	11th Dec. 16,236

Patents Sealed.

12,452	14,161	14,168	14,262	14,265	14,591	739
10,091	10,270	13,167	13,380	13,440	14,876	848
6,493	9,386	13,424	14,620	7,655	12,334	14,805
14,840	15,647	15,717	7,557	10,357	11,111	11,919
11,938	13,191	13,521	14,162	14,781	14,786	14,957
15,679	5,002	16,146	11,892	13,715	13,797	14,348
14,783	14,974	15,140	11,341	13,782	14,089	14,431
14,877	15,287	15,313	14,704	14,931	15,525	15,542
7,083	10,205	11,096	13,683	14,511	14,927	15,070
15,098	15,182	15,671	2,156	10,388	11,368	16,101
1,205	1,388	1,397	1,627	2,561	2,819	2,922
2,939	12,206	15,578	15,619	15,635	15,669	

The Journal of Fabrics AND Textile Industries.

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Notices.

The Yearly Subscription—payable in advance—including home postage, is 10s. Cheques and Post Office Orders to be made payable to H. & R. T. LORD, 10, Ann Place, Little Horton Lane, Bradford, Yorkshire.

The Publishers will be happy to receive intimations of New Inventions, Patents, &c.

The Publishers are open to receive, from Designers, Original Designs of Carpets, Damasks, Tapestries, Linen, Cretonnes, &c., and such as are accepted will be published with the Designer's name affixed. All Designs sent for approval must be 10 inches long by 7 inches wide for single page, and for double page, 16 inches by 10 inches, and must be accompanied by Postage Stamps sufficient to pay return Postage in case they are rejected.

Literary communications must, in all cases, be accompanied by the names and addresses of the writers, not necessarily for publication, but as evidence of authenticity.

Authors are requested to retain copies of their manuscripts; rejected manuscripts cannot be returned.

To prevent any misunderstanding, all Articles sent to the *Journal of Fabrics and Textile Industries* for publication will be considered as offered *gratuitously*, unless it is stated explicitly that remuneration is expected.

Readers are invited to forward items of interest to the Trades concerned.

The Proprietors will feel greatly obliged if any of their readers, in making enquiries of, or opening accounts with, Advertisers in this paper, will kindly mention the *Journal of Fabrics and Textile Industries* as the source from whence they obtained their information.

SPECIAL NOTICE.

We regret to inform our readers that we have been prevented, at the last moment, from giving woven samples along with our designs in this issue, our Agent in Paris, through a misunderstanding, having failed to forward us certain samples, as directed. We shall, however, be in a position to issue woven samples in our next number.

IMPORTANT NOTICE.

We beg to thank our friends for the generous support which they have extended to us, during more than five years, since this Journal was established. We have, in this period, given a great number of designs for every class of fabric, and as regards the designs for ornamental fabrics, we have hitherto stood alone, having, in this branch, had an entire monopoly amongst the textile journals of the world. In designs for Mantle Cloths, and in those for Ladies' and Gentlemen's clothing materials of every variety, including Worsted, Tweeds, Cheviots, &c., we have always endeavoured to be in the front rank, keeping as nearly as possible to the leading styles for each changing season. To enable us to do this with accuracy, most of our designs are produced in cloth before being published. To render this department of our Journal as valuable as possible, we have decided to give each month, commencing with this issue,

WOVEN SPECIMENS OF FASHIONABLE CLOTHS,

the Designs for which will be found in the usual place in our Journal. This is a feature hitherto only carried out by the proprietors of *one* Continental publication, which is issued at a high price, and, in undertaking it ourselves, we are conscious of the great expense we shall incur. We therefore ask our Textile friends to give us their active support, in order to render the experiment—which we shall try for one year—a complete success.

In addition to this, we have also had in consideration the opening of a *Department of Sale and Exchange* in our columns. This feature, if carefully carried out, is capable of great benefit to our readers. It is our intention to print Advertisements for our Subscribers (which are *not* strictly trade advertisements) free of charge under certain regulations. The class of advertisements which will be accepted are such as the following:—Partnerships Desired or Offered, Situations Vacant or Wanted, Mill Premises to be Sold or to be Let. We are desirous to make the scope of this department as wide as possible, but, as before stated, all strictly trade advertisements will be excluded, and a restriction will be placed upon the length of each advertisement; not more than six lines, single column, small type, being allowed.

The Subscription is Ten Shillings per annum, Post Free, prepaid. Post Office Orders, or Postal Orders, should be sent to H. and R. T. LORD, 10, Ann Place, Bradford.

Electric versus Gas Lighting for Mills.



DURING the last year or two, the practicability of economically lighting mills and workshops, by other means than the employment of gas obtained from the destructive distillation of coal, or cannel, has been forced more and more on the notice of those who pay, every quarter, large sums of money to one of the several gas companies. Those who think more of the quality of the goods produced at their works, and of the health of their workpeople, than of the expenditure of a few hundred pounds, have already adopted electricity. In ironworks, and establishments of a similar description, oil obtained from creosote is being used with success for illuminating. In some works it has even supplanted the electric light. This oil can be purchased at present at a very low rate, and, under a system recently invented, gives a light of unusual brilliancy. Whether the extended use of this fluid for lighting purposes will, in time, enhance the price of the oil used, the future only can prove. Waste products are always liable to considerable fluctuations in price. When their value is abnormally low, the notice of the ingenious is attracted to them, and, when some new method is discovered by which they may be utilised, an enhancement of value generally results. This oil, however, cannot be used for illumination in textile factories. Gas obtained from mineral oils is also being tried in some places, and is being spoken of hopefully, but, at present, this system is too much in an experimental stage for an opinion to be formed as to whether it will become an active competitor with coal gas. As the majority of textile factories obtain their gas from gas companies, they would be unable to adopt gas made from oil, unless they were prepared to undertake its manufacture themselves. As this would entail the erection of expensive plant, more costly than the adoption of the necessary electrical plant, the choice would appear to lie between the use of coal gas and of electricity. The cost of lighting by coal gas must, of necessity, vary greatly in different districts, as there exists no uniformity in the rates charged per 1000 cubic feet by the different gas companies. But, besides

the actual cost of the gas consumed, the annual gas bill is affected by a number of considerations, such as:—The way in which the rooms have been built; the surroundings of the mill—whether it be overshadowed by buildings, trees, or land; the arrangement and kind of machinery; the use of gas governors for regulating the pressure of gas supplied; the use of reflectors or their absence; the method in which the gas pipes for distributing the gas in the different rooms have been erected; and, lastly, the care which has been exercised to keep the pipes in good repair—to shut the gas off at the meter when not in use, and the renewal of the gas burners every year. Some years ago, it was found that the annual cost per burner in the mills of a large manufacturing town in Lancashire averaged about 5s. In the oldest mills, it reached as high as 10s. per burner, per year; whilst in one mill, where great economy was observed, and where the gas arrangements were on the most approved system, the annual cost per burner was as low as 4s. But to be able to fairly compare the cost of gas with electricity for illumination, it is requisite to add other items of cost to the actual amount of the gas bill. Firms of standing, erecting mills for their own use, would, probably, not hesitate to adopt electricity in place of gas. We, therefore, do not propose to compare the cost of lighting a new concern, but, rather, to take older concerns where gas is already employed, and to investigate the question as to whether an alteration to electricity would be advantageous. Besides the gas bill, where economy is exercised, an annual outlay upon gas burners must be allowed. Bad gas burners are very wasteful. Many good concerns now renew all the gas burners every autumn. Again, it is a mistake to suppose that gas pipes will last for “ever.” Apart from the fact that they become defective in time, largely owing to the constant vibration they are subjected to when the mill is at work, they also become choked up by dirt deposited, more or less, by all gas. This dirt, by lowering the pressure at certain points, causes unequal lighting, and, consequently, prevents economy. At times, therefore, the pipes require to be taken down and cleaned out. This is too often neglected, and much loss then occurs through extra consumption of gas. It would, probably, be nearer the mark to take 6s. per year as being the cost per burner in a factory where average conditions exist, and 11s. in factories that are dark, and where, on dull days, the gas has to be kept burning in some of the rooms during the whole of the working hours. The present cost of fitting a mill with gas pipes, including gas governors, but not gas meters, is about 6s. per light when reflectors are not used, and 14s. to 15s. per light when reflectors are used. When reflectors are used, one-half the quantity of lights generally suffices, so that the total capital expended is only about 15 per cent. more. The cost of lighting a factory by electricity varies (per lamp) considerably, according to the size of the plant required, and whether an extra steam engine has to be erected. Where sufficient steam power is available, the cost per lamp runs from 32s. to 40s. The lamps referred to being those known as the incandescent. But one of these lamps will give more light than two gas lights without reflectors, and more than one gas light with reflector. One lamp with reflector would light four 8/8 looms, and five lamps would be fully ample to light a pair of mules containing 200 dozen of spindles. It is possible that, with improved arrangements for the utilising of reflectors, four lamps might be made sufficient. One hundred lamps of 16 candles require 10 horse power, or cost in power rather under 9d. per hour, or 009d. per hour, per lamp. The life of a lamp averages 1,000 hours, and costs 5s. to replace. Where great care is exercised, the average life is longer than that stated. The cost, therefore, of working 100 lamps for 1,000 hours is, for power, say, about £3 15s., for lamps £25—or a total of £28 15s. It is necessary to leave to the judgment or experience of our readers the number of hours per annum he requires artificial light in his factory. As shewn, this varies widely. So, whilst some would only expend, say £15 out of the £28 15s. for 100 lamps, others might require to expend the whole £28 15s. Taking the cost of the plant at £2 per lamp, 100 lamps would cost £200, which, at 12½ per cent. (being 5 per cent. interest and 7½ per cent. depreciation), would give £25. The annual charge for interest and depreciation is the same, whether the lamps are required for a longer or shorter period per annum. The total annual charge may, therefore, be taken

as being £40 per 100 lamps in some mills, to £54 per 100 lamps in others. Taking 100 lamps as being equal to 200 ordinary gas burners, and taking the annual cost per gas burner as being from 6s. to 11s., the comparisons are as follows:—Gas, £60, £110; electricity, £40, £54. Showing that, for the artificial lighting of mills, constructed so as to require considerable artificial light, and where sufficient and suitable engine power already exists, the electric light presents sufficient margin of saving to risk any loss that might be incurred from the adoption of a system, in the use of which the employées are not experienced.

(To be continued.)

Manchester Chamber of Commerce.

THE COMMISSION ON TRADE DEPRESSION.

Mr. Gaddum, the President of the above Chamber, moved the adoption of the report, and stated that when trade marks were first introduced there were upwards of 50,000 connected with the cotton industry alone. He believed that nearly one-half of the trade marks in the country belonged to that trade. It was difficult to define where the colourable imitation began, what interests were concerned, and where the right of user commenced, and it was certain that this matter could not be satisfactorily dealt with unless there was an office in Manchester which would take the applications for the registration of trade marks from the beginning to the end. The office already established in Manchester could not finally dispose of applications. They were finally dealt with in London, and a gentleman, perhaps less conversant with the usages of trade marks, was apt to take different views of what constituted a colourable imitation from the official here. The Board thought that, if this official were to be the final authority to decide questions of this kind, the question would be deprived of a great many of the difficulties that at present surrounded it. He thought the Government had acted very wisely in deciding to introduce next session a bill which was to deal with trade marks, and the promised visit of Lord Stanley would, he believed, be a considerable help in leading him to frame this measure. Another subject which had occupied the attention of the Chamber was the stamping of lengths on piece goods shipped to India. It had been shown with great force that merchants would considerably assist in checking the deplorable practices which had, of late years, crept into its trade by simply declaring that they would not, after a certain date, ship a piece of goods without stamping on the face, in addition to the number which was intended to indicate the real length, the word “yards” or the contraction “yds.” By introducing this, it was thought that they would be going a long way towards re-establishing the character for honesty of which British merchants used to be proud, and which he had no hesitation in saying had, of late years, considerably suffered in that direction. In support of the wish to do away with the false stamping, they had been requested to address Chambers of Commerce in India, and he hoped, through the representations of the Indian Government, they would meet with success. He could not, however, but be rather sceptical as to the success of that action, because they had made similar applications more than once, and the result had been very indifferent. It might be that the Government would this time take a hint from the report of the Commission on the Depression of Trade, which stated that “manufacturers, especially in the hardware trade, might find it more profitable to be a little more honest by not using fraudulent trade marks.” Fraudulent trade marks and false stamping of lengths on piece goods, he considered, almost identical. When the late President of the Chamber last addressed them, he dwelt at some length upon the importance of finding new markets for the production of their mills. He dealt particularly with Burmah, which had just then been annexed, and also with Africa, but he did not propose to enter largely into the question of Africa, because, as they doubtless knew, Africa was being attacked, as it were, from all quarters—north, south, east, and west. Roads were being opened, and before very long we should know more of that continent. Whether from British enterprise, or from the efforts of other nations, he believed there was no doubt about it that our direct and indirect interests with Africa were increasing, and would continue to increase. At the same time, he could not help thinking that Africa was a “dark continent” still. We should only make slow progress there, and, if we did succeed in steadily increasing our relations with the whole of that country, we should at the best only have customers who were in the earliest stages of civilisation, and men in that condition had no great wants. He was far more hopeful when he looked to the East. India had, he thought, exceeded our most sanguine expectations in the last few years. He believed Burmah would some day be pacified, and, with peace in Burmah, our trade there would undoubtedly largely increase, even if we did not get those railways, of which we had heard recently, up the valleys leading to the north. There was another direction in which we could open communications—viz., Thibet. They had heard, within the last few months, of the intended mission to Thibet commanded by Mr. Colman Macaulay. The commission met at Darjeeling, but, unfortunately, owing to the intrigues of the people carrying on the trade

there, the Chinese Government, which exercised considerable influence in the country, was induced to move our Government to prevent the progress of the mission. We had it now on the best authority that the road north over the enormous mountain chains which separated India from Thibet was easy and useful at all seasons—even at the height of winter, with, perhaps, very short interruptions. If we were not to be debarred from trading and exchanging the produce of India and the cotton manufactures of this country for the valuable wool, which was produced in such large quantities in Thibet, by the selfishness of one or two individuals, who could be controlled by the Chinese Government, he thought we should move the Government here, with all energy, in order that we might be put upon a better footing. They would find in a recent number of the *Times* a statement that it would probably not be wise at present to push the matter, owing to certain difficulties which still existed in the treaty with China in regard to Burmah; but he could not help thinking that, as China was now governed by a Minister who was extremely enlightened, and who had lately been joined by the Marquis Tseng, also a most enlightened Chinaman, the duty of the Chamber would be to urge that Mr. Macaulay might before long be instructed to go again to Thibet. It would be a great pity if time were lost in cultivating that ground. The Chamber had had a visit from another gentleman well conversant with China.—Mr. Hosie, whose representations, based upon a ten years' residence in the south-west of China, were calculated to carry considerable weight; he urged the importance and feasibility of improving the navigation of the Yang-tsze as a means of developing trade with China. With reference to the report of the Commission on the Depression of Trade, which had sat during the last fifteen or eighteen months, and which had just published the last of its reports, no doubt these volumes contained most valuable information collected by evidence from every possible quarter to which the Commission had access, but when the results of those labours and the evidence obtained were summed up, what did they find? He could not help thinking that, as the *Spectator* put it, in a recent article, the result was, "Work and wait." The Commission had nothing to tell which men, who had their wits about them—shrewd business men—could not have told before the Commission began its operations.—Mr. Houldsworth, in seconding the adoption of the report, said he was quite free to confess that the criticism passed upon it by the President was, perhaps, not wholly undeserved. He quite felt and admitted that the conclusions, especially when compared with the anticipations that some people had formed of the result of the Commission, might appear to be very feeble and very weak, but he trusted that the fault rested with the anticipations, and he was not speaking after the event when he said that he did not think, nor did he suppose that any sensible business man in Lancashire expected, that the appointment of a Commission, or any Government administration that might be exercised, would convert depressed times into good times. Although the conclusion of the Commission might appear to be feeble, there was a great deal more in the report than could be found from a mere cursory glance, and some very important facts had been brought out. What was meant by depression was an absence of profit to the capitalist. That, he thought, was one feature that had been brought out. It had been defined distinctly what was meant by depression. Then it had been shown that, notwithstanding the depression which existed, notwithstanding the absence of profit, and the cloud that had hung over industrial enterprise throughout the country, affecting both operatives and employers—during the whole of that time, the volume of trade had been increasing, profit of trade appeared to have been increasing, railway traffic had increased, shipping had increased, and every element that appeared to make up the commercial condition of the country showed that we had been advancing rather than retreating. Along with that, there appeared the remarkable fact that, while trade had been increasing, or, at any rate, not seriously diminishing, the profits had gone into a greatly increased number of hands, and had been distributed over a much larger area than before. With regard to the Railway Rates Bill, the Government were bringing in a measure which, he believed, would, to a great extent, follow the lines of Mr. Mundella's bill. He hoped the result would be that, while traders had the opportunity, as they ought to have, of going before a tribunal in an easier and cheaper way than they could at present, on the other hand, nothing would be done to strike a blow at the railway system, or at all to keep back capitalists from investing their money in undertakings which were of the greatest service, when properly conducted, to the commerce of the country. He had very good information that shortly the Government would see their way to re-opening trade with the Soudan. The revolts and the disturbances on the frontier were, to a very great extent, disappearing, and he had reliable information that the Government, if they had not already decided, were on the point of deciding that trade might again be permitted between Egypt and the Soudan. He should like very much, if the Chamber could see its way, at once to appoint a strong committee to go into the question of the amendment of the Limited Liability Acts. He did not know what information the members of the Chamber might have on the question, but he was bound to say that, having considered very carefully this question for the last few months, and having looked at it thoroughly from both sides, he had come to the conclusion that amendment was urgently required and ought to be very carefully framed. He thought the deputation to Lord Salisbury the other day was successful in showing that some amendment was

necessary and desirable. His Lordship, speaking officially, said the subject would receive the attention of the Government as soon as possible, but he (Mr. Houldsworth) had not much faith in the amendments which would come out of the official bureau of the Board of Trade. He would infinitely prefer that that Chamber, having a practical knowledge of the imperfections of the Acts, and also of their advantages, should form a strong committee to go into the question carefully, laying down principles for fresh legislation, and the limit beyond which legislation should not go. His conviction was that the secret of their success would be to lay down clearly the lines within which they could do good, and beyond which they would only do harm. He thought that those principles could be laid down here by practical men much more easily than in London, and he did not think that the committee should be confined to members of the Chamber.—Mr. H. F. Hibbert gave notice of proposing at the next meeting of the Chamber, "That with the view to encourage the more regular employment of labour at home, and to strengthen the relations between Great Britain, her Colonies and dependencies, this Chamber is of opinion that a comprehensive measure of fiscal reform is necessary, and recommends—1, the imposition of moderate tariffs for revenue purposes on all manufactured articles from protected countries competing with our own industries, with a corresponding reduction of the burdens which bear so heavily on the mercantile community at home; 2, the abolition of all duties on tea, coffee, cocoa, chicory, and dried fruits, and the imposition of revenue duties of an equal total value on wheat, barley, oats, rye, peas, beans, meal and flour from protected countries."

Worsted and Woollen Cloths for Spring and Summer Seasons, 1888.

We have now on hand new patterns which give the latest ideas in design and colouring of cloths for ladies' and gentlemen's wear, for the spring and summer seasons of 1888. These we shall be pleased to forward to any of our subscribers at £2 per 100 samples. As during former seasons, the selections embrace fancy and plain worsteds, cheviots, tweeds, saxonies, mantlings, and dress fabrics, and any manufacturer wishing to have the patterns most adaptable to his branch of business, in order to keep pace with the times, can have a selection forwarded post free on sending postal order for the above amount. In fancy worsteds of the finer makes, and of light colourings, the patterns are most striking in their effects, and are a distinct advance upon former seasons' fabrics. Silk is still much used, and is manipulated in the varied weavings in most effective manner. Perhaps, in design, there is nothing absolutely new, the run being, as usual, in small and medium-sized weaves in checks, stripes, &c., but in colouring, some rather surprising combinations are introduced, which, if not altogether suitable for the home trade, ought to have a good run for export to the hotter climates. In plain worsteds, not much headway has been made in the production of new designs, but still there are a few new things which ought to be good guides to makers of these fabrics, and enable them to increase their business. Nearly all the worsted patterns can be woven without the jacquard, although some few samples will require that mechanism. In tweeds, cheviots, and such like cloths, checks, stripes, and mixtures have still the lead, but, perhaps, striped effects will have more hold upon the markets in 1888 than has been the case for some time past, and the tendency seems to be towards narrow effects (anything but bold), with, in some cases, a large check of from $\frac{3}{4}$ to 1 inch square thrown over them, this check not showing up prominently, but faintly, and varying in colour but slightly from the stripe itself. In checks, there are some admirable patterns, these allowing more scope for the designer than stripes. They are in a variety of forms and colourings, the latter being used very artistically, the equal blending having a very telling effect. In some of the samples, the colourings are so distributed that no single one rises above another, and still the pattern shows distinctly, whilst in others, one colour shows more prominently than the other, and thus gives decision to the check. High colouring seems the rule even in the lower qualities of cloths, although there are many exceptions. For cloths for gentlemen's wear, the rougher makes of yarns, as knopped, curled, &c., are mostly discarded, still, a few patterns have waste silk and worsted yarns of the above kinds worked in to form large over checks, and this they do

very effectively. In mixtures, the colouring is mostly subdued and equally distributed, but they make very saleable-looking cloths. In finish, nearly all the patterns leave very little to be desired in this respect, as rapid strides have been made in this department of manufacture during the past few years. In mantlings, curled effects are still in vogue, although not in such profusion as has been the case during the past few seasons, but there are other cloths that ought to meet with as ready a sale as the curled and such like rougher makes of fabrics have had. In dress goods of the plain kinds there is little new, but in fancy fabrics, the variety is large and of exceptional merit both in design and in the manipulations of warp and weft in weaving. A very prominent feature in many of the patterns is velvet on silk or woollen grounds, in the form of broad stripes, or along with which jacquard patterns in flowers will be woven. Velvet stripes will also be seen on woollen grounds dotted here and there with various coloured spots. Antique and heraldic designs upon a cashmere ground, crossed diagonally by broad velvet stripes, will form an elegant design for the season. Stripes and checks are also of corded silk, camels' hair, mohair, or vicuna on various woollen grounds; the stripes being plain horizontal or patterned lines. Again, the same cords are worked over the entire surface of the woollen material in a variety of designs, giving the fabric the appearance of being covered over with gimp. Amongst the patterns before us, we notice a variety of semi-transparent specimens of worsted, after the style of coarse crape. Checks with brilliant colourings on a sombre ground are likely to meet with great favour, such as crimson and light blue silk on a navy ground, crimson silk on dark green ground, light brown and gold on a dark brown ground, &c., &c. On the whole, the selection for the season is one likely to be useful to manufacturers of such fabrics, but the variety is so great that it would be impossible to do more than mention a very few of the specimens to hand. *Kuhlow's Gazette* speaks of some Himalayan cashmere stuffs, carried out in the modern *beige* and other fashionable colours. The return to these soft materials is much more adapted for winter than summer. Woollen goods manufacturers have in view for the former season the introduction into the dress-goods business of a soft velvety stuff, and they are already busy with winter patterns—Himalayan stuffs in dark colours, with broad slightly-shaded stripes, &c. We do not think we shall be far wrong if we assert that the so-called short-hair Himalayan materials are destined in a great degree for the near future, either in light qualities for clothing, medium thicknesses for waterproofs, or full thicknesses for mantles; at least this seems the opinion of Parisians, who have already adopted the fashion. Roubaix manufacturers are preparing patterns on a large scale in this class of goods for next autumn. Silk goods seem likely once again to come into favour for ladies' wear. The above authority states that ribbed silk goods, whether they appear under the name of Bengalese, Faille française, or "coarse duchess," are all covered with tiny roses, woven into the main part of the fabric. These patterns serve to show that for the coming designs preference will have to be given in every way to those having relief effects. The new Lyon materials have again discarded the various cross patterns, although it may not be said that these have disappeared entirely from the market, and that they are not much in demand, as they are admirably adapted for some young ladies, but they are only manufactured by firms who work for a large consumption, rather than for any particular taste. For jacquards and brocades, flowers form as yet the principal designs, in spite of attempts to order otherwise. It is scarcely necessary to add, considering the unlimited vagaries of fashion, that these flower patterns are diversified as much as they possibly can be. Besides these large patterns, there is a number of small ones; as well as the diminutive roses mentioned above, we find lilliputian violets, pansies, &c., decorating the main fabric. Frequently this effect is produced on velvet, and one can easily imagine the charming appearance the pansies would give to this material. The great industries will now naturally be fully occupied with these various patterns, and we certainly think that, for example, heliotrope-coloured cashmeres with inwoven miniature silken pansies (where possible attached to the stalk), give an excellent design for autumn stuffs, which, while very pleasing to the eye and taste, are not excessively expensive.

Cotton Piece Goods Exports from the United Kingdom.

It is remarkable that the great increase shown in the quantity of cotton piece goods exported from the United Kingdom last year, when compared with that for 1885, is almost entirely accounted for by the growth in the shipments to India. The aggregate increase was 485,500,000 yards, or 11.1 per cent., and of this amount India took off 454,400,000 yards. Amongst the larger markets to which diminished quantities were sent are China, Turkey, Egypt, the Straits Settlements, and Japan. Judging, however, from the activity shown in the demand for China staple goods manifested in Manchester, during the last few weeks of 1886, it may be concluded that the deficiency in the exports to that country is likely very soon to be made good. In the annexed table, the quantities of yarns and goods shipped to each market in 1885 and 1886 are given:—

	1885. lb.	1886. lb.
Cotton, Yarn, and Twist—		
Russia	1,705,900	1,698,400
Sweden and Norway	4,432,000	4,145,000
Denmark	4,151,200	4,359,700
Germany	32,754,000	36,766,400
Holland	41,692,600	41,516,400
Belgium	12,250,000	15,738,600
France	14,782,800	17,323,000
Italy	13,945,100	10,907,400
Austrian Territories	2,067,100	2,505,200
Roumania	7,357,900	7,318,700
Turkey	19,454,300	21,724,800
Egypt	4,202,200	3,976,700
China and Hong Kong	20,373,900	10,598,200
Japan	12,687,200	16,332,200
British East Indies—		
Bombay	14,728,500	16,105,500
Madras	9,625,200	13,304,200
Bengal	17,166,900	17,201,000
Straits Settlements	2,915,700	3,130,700
Ceylon	93,000	112,300
Other countries	9,424,400	9,581,700
Total	245,809,900	254,346,100
Cotton Manufactures—Piece Goods of all kinds—		
	Yards.	Yards.
Germany	44,710,700	45,355,900
Holland	39,647,400	34,132,200
Belgium	54,838,200	61,497,100
France	45,052,000	35,474,900
Portugal, Azores, and Madeira	49,266,500	54,319,200
Italy	85,566,100	85,051,700
Austrian Territories	6,449,000	6,389,700
Greece	29,921,800	36,021,000
Turkey	316,336,200	299,706,700
Egypt	142,491,400	139,468,700
West Coast of Africa (foreign)	42,050,400	37,343,900
United States	46,154,400	45,251,200
Foreign West Indies	77,170,900	90,238,200
Mexico	26,777,100	32,312,200
Central America	36,911,200	37,503,800
U.S. of Colombia	22,238,300	42,890,800
Venezuela	13,720,100	23,718,200
Brazil	190,096,700	241,035,500
Uruguay	25,333,000	35,732,600
Argentine Republic	66,212,200	104,812,100
Chili	41,843,600	59,701,800
Peru	20,033,900	33,393,000
China and Hong Kong	523,927,000	455,823,000
Japan	45,412,400	34,628,500
Dutch Possessions in India	103,135,200	86,592,400
Philippine Islands	56,635,900	43,214,700
Gibraltar	14,703,500	12,104,500
Malta	27,027,400	24,021,500
West Coast of Africa (British)	31,694,000	28,490,100
British North America	33,245,800	32,584,700
British West India Islands and Guinea	39,557,900	42,893,000
British Possessions in South Africa	22,339,900	21,463,800
British East Indies—		
Bombay	603,376,800	797,776,900
Madras	98,637,300	142,687,200
Bengal	962,622,500	1,178,374,100
Straits Settlements	121,157,700	103,929,600
Ceylon	10,461,600	14,868,200
Australasia	110,471,400	96,756,300
Other countries	147,289,100	152,471,300
Total—		
Wholly of cotton, unbleached or bleached	3,149,905,600	3,497,859,400
Printed, dyed, or coloured	1,224,423,800	1,351,803,100
Mixed materials, cotton predominant	187,100	367,700
Total	4,374,516,500	4,850,030,200

Co-operative Movement in the Woollen Trade.

Co-operation as applied to distribution has long ago won its way to popularity and success. On the other hand, the majority of attempts hitherto made to introduce the same principle into manufacturing industry in England have resulted, in some cases, in absolute failure, and but seldom in any striking success. On this account, the conversion of a well-known Huddersfield manufacturing concern—that of Messrs. W. Thomson and Sons—into a co-operative society has attracted unusual interest. There is no disguising the fact that the unfortunate issue of Messrs. Briggs's experiment in co-operation in 1875 was a severe blow to the movement, and, since the abandonment of that attempt, manufacturers have been very shy of courting failure in the same direction. Since 1875, however, many things have happened, and there are good grounds for believing that the various forms of industrial partnership may now be as successful here as they have long been in France. It is almost needless to say that the change in the constitution of Messrs. Thomson's firm is the result of long and careful consideration of the problem of capital and labour on the part of those responsible for the alteration. Without such previous preparation, an important step, like the one under consideration, could hardly be taken. Mr. George Thomson, the present head of the firm, has for many years taken an interest in the co-operative movement. Fortunately for the prospects of co-operation, Mr. Thomson had faith enough in the principles he professed to be willing to run personal risk in carrying them out. He offered to work the Woodhouse Mills as a co-operative society, and on October 14, 1886, the firm was registered under the title of William Thomson and Sons, Limited. The new experiment starts under favourable circumstances. The firm is an old-established one, and is said to bear a good reputation for the manufacture of woollen cloth. It has enjoyed an amount of freedom from strikes which argues well for the relations between masters and men. Presumably, therefore, there are no standing grudges, no bitter enmities engendered of past struggles, to mar the chances of amicable co-partnership. In forming the Committee of Management, care has been taken to represent the organisations which have the confidence of the working classes. The Provisional Committee of nine members includes two representatives of the Huddersfield District Co-operative Association, two from the local Trades Council, and two employées of the Woodhouse Mills. It is sometimes said that trade unions do not look with favour upon the co-operative movement; but, however this may be, the Huddersfield Trades Council has, in this instance, proved itself superior to any narrow prejudices of the kind. The new society retains the services of Mr. George Thomson as manager, thus gaining the benefit of his experience and business connection, an arrangement which can hardly fail to assist the new venture very materially. Throughout the town, great confidence is expressed in Mr. George Thomson's personal qualifications for the arduous task he has undertaken. It is felt that he has the enthusiasm, the belief in the goodness of his cause, which are among the necessary elements of success in all new undertakings, and that he is fully prepared to devote himself to the interests of the society as closely as he would to his own. When to these qualities (too often the monopoly of the social dreamer) are added the training and experience of the practical man, it must be admitted that the experiment is being entered upon under favourable conditions. In such undertakings, and especially in the youth of the co-operative movement, the personal element cannot be left out of consideration. Co-operators are never tired of reminding us that "co-operation is the child of confidence," and it is satisfactory, therefore, to observe that this preliminary appears to be already provided in the case of the Woodhouse Mills. The society has taken over the business of Messrs. William Thomson and Sons at a valuation made by Messrs. George Tinker and Sons, of Huddersfield, Mr. Thomson stipulating that nothing should be charged for "goodwill." So much of this amount (something under £20,000) as has not been taken up in shares, will remain as loan stock, bearing interest at the rate of 5 per cent. per annum, and, so long as this interest is duly paid, the principal cannot be demanded. The shares, which are of the value of £1 each, bear 5 per cent. interest per annum as a first charge on the profits of the business. If the state of business does not permit this dividend to be paid, the deficit "shall be a first charge on the subsequent profits, but without interest." Not less than 10 per cent. of the profits are to be carried to the reserve fund until this fund amounts to 10 per cent. of the capital. These charges being satisfied, the "net profits" are divided as follow:—Five-ninths are divided among the workpeople who have been employed by the society for not less than six months. The remaining four-ninths are to be applied either to the reward of special services, or in making allowances to customers, or in other ways recommended by manager or committee. The workpeople's share of profits is not paid in cash, Mr. Thomson, like many Continental employers who have tried the same experiment, preferring the system of deferred payments. Each person's portion of the dividend is left to accumulate for his benefit until it reaches the value of a share, when it, of course, bears interest like other shares. In this way, the employé may gradually put together a sum of money, which will be of the greatest service to him later on in life. The proposal to make allowances to customers spreads the co-operative net still more widely, and its advocates hope that it may result, in the long run, in the encouragement of honest manufacture and honest trading.



EMINENT TEXTILE MEN. No. 7.

W. H. Houldsworth, Esquire, M.P.

The subject of our sketch was born at Ardwick, near Manchester, in the year 1834. His grandfather came from Nottinghamshire, where he and a brother owned a considerable estate, now in the possession of Mr. James Houldsworth, of Coltness, Lanarkshire, elder brother of Mr. W. H. Houldsworth. His great uncle, Mr. T. Houldsworth, who was for many years the Member of Parliament for Pontefract, and afterwards for the Northern Division of Nottinghamshire, settled in Manchester towards the end of the last century, and there established a spinning concern for fine cotton yarns, which (consolidated and enlarged by his nephew, Mr. Henry Houldsworth) has been still further extended by the son of the latter gentleman, the subject of our sketch. Mr. H. Houldsworth, seeing that Manchester was not likely to hold its position as the home of cotton spinning, purchased an estate in 1864 at Reddish, near Stockport, and there built a model mill for fine spinning. Mr. W. H. Houldsworth, after receiving his education in Manchester and at St. Andrew's University, joined his father in the cotton spinning business, and in this branch, and in various mechanical improvements, especially in the process of combing, he contributed largely to the success of the firm of Messrs. Thomas Houldsworth and Co. After the death of his father, Mr. W. H. Houldsworth became the head of the concern, and continued to supervise the business until within the last few years. Several mills have, from time to time, been built at Reddish by the firm, and the place has become, through the liberality of Mr. Houldsworth, a very thriving village. In addition to giving sums of money for various charitable objects, he has built for the inhabitants a school, a working man's club and a church. In social matters he has always taken a most prominent part, sparing neither time nor money in the furtherance of good causes. His work has greatly benefitted many undenominational institutions, such as Owen's College, the Young Men's Christian Association, and various educational institutions; and to societies in connection with the Church of England, he has been more than a friend. In 1880, Mr. Houldsworth went to the poll as a candidate for Parliament for Manchester, but was defeated. On the death of Mr. Birley in 1883, he again contested the city, and was returned in the Conservative interest by a large majority. He still sits as member for one of the divisions of Manchester. In industrial matters, Mr. Houldsworth has always been to the front; he has been a strong advocate for technical education, and has shown it in a practical form by attending meetings and subscribing liberally. He is one of the chief promoters of the Manchester Ship Canal, and is chairman or member of various industrial committees. In Parliament, Mr. Houldsworth has already done good work, especially in matters connected with the various industries of this country, and he is always ready to further the interests of all matters connected with the cotton trade. Towards ameliorating the hard conditions under which the operatives often work he has done much, and, from time to time, he is called upon by deputations to lend his aid in order that they may be introduced to the higher authorities, and so have an opportunity to state their views on trade matters; and these calls he invariably answers by making speeches on behalf of the deputations, and in other ways furthering their causes.

The *London and China Telegraph* is informed that several wealthy merchants and others, whose names are well known in England, but who have not hitherto been actively engaged in the China trade, are convinced that good opportunities will occur during the next few years in that country. They therefore propose to exploit it in several directions, for they are of opinion that the "awakening" is in earnest. One of the measures they have in contemplation is to give a better service of telegraphic news, so as to gradually leaven the intelligence of China with the state of affairs in Europe, &c., as they believe a much better service than that now existing would be profitable to all.



ORIGINAL ✠ DESIGNS.



On our first plate we give a portrait of W. H. Houldsworth, Esquire, M.P., about whom much interesting information is given on page 17, under our heading of Eminent Textile Men.

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Our second plate contains a handsome design for a Tapestry Table Cover. It is the work of Mr. F. Layton, Akroydon, Halifax.



Wool.—At the London wool sales, there has been a brisk competition for most classes of wools, the Continental buyers especially bidding keenly. Prices generally have ruled higher. In the Yorkshire and Scotch districts, a good business has been done at firm rates, especially in the finer classes of wools, these acting more in sympathy with the London sales than the lower sorts of wools. The spinning branches have kept fully employed and fairly remunerative, and manufacturers of piece goods have also been well employed, although, in regard to prices, there is much competition.

Woollen.—Although there was a certain quietness pervading this branch during the first two weeks of the year, the business done during the latter end has reached the average. Fancy worsted coatings in the finer qualities still meet with a good demand, whilst for medium kinds, there have been more inquiries. The plain classes of worsteds have also gained fair attention. In the woollen department, for fancy cloths in good and effective designs and colourings, there have been many orders given out in various qualities, and the prospects for these branches, during the next few months, are hopeful. The unsettled state of affairs on the Continent affects business to a certain degree, and orders from France and Germany are fewer than usual at this time of the year. Full time is the rule in most mills, whilst certain firms are running overtime.

Cotton.—The markets for the raw material have fluctuated slightly, but on the month there has been little change in values. Spinners have, perhaps, improved their position as regards prices during the past month, but still, judging private firms by the results of dividends of public companies, those engaged in the spinning branches of the cotton trade are not having a very good time, as far as making money is concerned. In the Oldham district, yarns have been produced a little ahead of the demand, and this, of course, keeps down prices. In the Bolton district, rather improved rates have ruled, with a better demand. Manufacturers have had a fairly good time recently, and the demand for most classes of cloth has improved, and, in consequence, higher rates have been asked and conceded, and an advance in prices firmly established. Taken all round, manufacturers are fairly well employed at paying rates.

Linen.—There has been a general improvement manifested in the various branches which may be classed under the head of linen. Flax has had more inquiry, and prices have hardened somewhat. In linen goods, a better tone has prevailed, and there has been more employment. Jute yarns have been in good demand and the same may be said of goods, and prices have advanced in nearly all classes. Orders have been booked freely both for home and foreign account, and the prospects of future trade are at present very hopeful.

Lace.—The outlook for this branch of industry seems to be more hopeful than for months past. Numerous inquiries have been made for nearly all classes of goods, and, although the actual business done has been but limited, still the inquiries made lead manufacturers to infer that a brighter prospect is in store for them. The curtain branch has improved both with regard to orders and prices, although there is still some machinery idle. Coloured Maltese and torchon laces have had a fair demand and silk goods have improved. Cotton goods have also met a fair sale.

Russian Manufactures.

Mr. Consul J. Mitchell, of St. Petersburg, has found his labours increased, and has been subject to "great pressure," owing to the diversion of trade from the port of Cronstadt to St. Petersburg by means of the marine canal. Consequently, his report for 1885 has only just been issued. It is calculated that Cronstadt lost about one-fourth of its trade in that period to the benefit of St. Petersburg. The most important manufacturing districts — Moscow, Vladimir, and Nijni Novgorod — are situated within the limits of this consulate. Notwithstanding the excessive protective duties, the manufacturing industry of Russia, instead of developing and exhibiting signs of prosperity, is at present suffering from a state of great depression. The cause of this is attributable on the one hand to the decrease of the purchasing power of the population consequent on impoverishment, and on the other to excessive production during preceding years. Technical instruction is wanting amongst industrial hands, which also tells in favour of the sale of foreign goods. An enquiry under this head elicited the fact that, in the province of St. Petersburg, where there are 729 factories, 84.50 per cent. of the foremen employed were without technical training; in Moscow, out of 1,917 factories, 95.63 per cent.; in Vladimir, out of 409 factories, 90.67 per cent.; and in Riazan, out of 421 factories, 98.38 per cent. Protection is therefore needed to aid ignorance, for where foreign technically-instructed foremen are employed in the manufactories no protection is required. Apart from outside competition, the manufacturers of Central Russia have to contend against the cotton mills established by Germans at Lodz, in Poland, and the Government are now considering whether they can take steps to handicap the latter in any way. No favourable change in the commercial relations between Russia and Great Britain can soon be expected, the Russian Government not only standing by its protective policy as regards trade, but also initiating other measures, such as controlling railway rates, which tend to hamper over-sea commerce.

Rheea Fibre.

Mexican papers to hand by the last mail contain an unusually large number of references to the cultivation of the ramie and other fibrous plants in Mexico. The *Diario Oficial*, for instance, in its industrial and agricultural section, reproduces articles descriptive of the rheea (ramie) plant, including notes upon the cultivation of the plant from experts in India, and other information taken from reports to the British Government. In non-official journals, too, we read that "notwithstanding the fact that valuable fibrous plants abound in Mexico, and that the Government is doing everything in its power to utilise them, quite an effort is being made to disseminate useful information concerning ramie." It is considered most probable that the plant would flourish in many parts of Mexico, and attention is drawn, in support of this view, to the immense growth in the proportions of the henequen (hemp) trade of Yucatan. As regards the last-named trade, the local papers of Yucatan report a marked improvement in the market. The fibre, which forms one of the most important articles of export, is said to be not only holding its own in foreign markets, but to have recently risen very considerably in price. The Yucatan dealers say that henequen, even at its high price, is preferred in New York to all other hems, and stands remarkably well in all other foreign markets.



EMINENT TEXTILE MEN.

No. 7.—W. H. HOULDSWORTH, Esq., M.P.



TAPESTRY TABLE COVER.

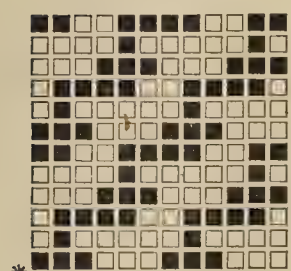
SPECIAL NOTICE.

We regret to inform our readers that we have been prevented, at the last moment, from giving woven samples along with our designs in this issue, our Agent in Paris, through a misunderstanding, having failed to forward us certain samples, as directed. We shall, however, be in a position to issue woven samples in our next number.



Tweed Suiting.

No. 424.



* Design.

4,032 ends. Finish clear and smart.
60 ends per inch.
60 picks „ 24 ozs. to the yard.
4 ends in a reed.
15's slay. Straight Draft.
67 inches wide in the loom.
56 „ when finished.

Warp:—

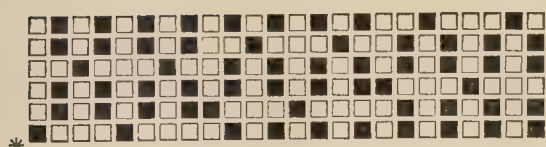
9 ends Black 20 skeins woollen.
9 „ 40 „ twisted to Stained 40 skeins, 20 runs per inch.
3 „ 40 „ „ „ „ „
2 „ 20 „ „ „ „ „
4 „ 40 „ „ „ „ „
9 „ 20 „ „ „ „ „
7 „ 40 „ „ „ „ „
2 „ 40 „ „ „ „ „
9 „ 20 „ „ „ „ „
9 „ 40 „ „ „ „ „
9 „ 20 „ „ „ „ „
1 „ 40 „ „ „ „ „
8 „ 40 „ „ „ „ „
9 „ 20 „ „ „ „ „
7 „ 40 „ „ „ „ „
2 ends Crimson 40 „ „ „ „ „ „

Woven as warped, with the exception that the Black and Stained twist in warp be crossed with Black and Salmon twist in weft.

Striped Woollen Trousering.

No. 425

Warp:—



* Design.

8 ends Brown, 28 skeins woollen.
8 „ Green, „
8 „ Drab, „

Woven:—1 pick Brown, 28 skeins woollen.

1 „ Green, „ „
1 „ Drab, „ „

5,712 ends.

84 ends per inch.

84 picks „

4 ends in a reed.

21's slay.

68 inches wide in the loom.

56 „ when finished.

Mill to width. Velvet finish.

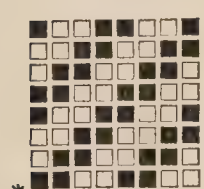
25/26 ozs. to the yard.

Straight Draft.

Woollen Suitings.

No. 426.

2,048 ends.



* Design.

32 ends per inch.

32 picks „

4 ends in a reed.

8's slay.

64 inches wide in the loom. Straight Draft.

56 „ when finished.

Cheviot finish.

Weight 24 ozs.

Warp:

Woven as warped.

6 Black woollen, 12 skeins.

1 „ 14 skeins twisted to White, 40 skeins, 10 runs per inch.

1 Brown 16 „ „ „ „ „

1 Black 14 „ „ „ „ „

1 Brown 16 „ „ „ „ „

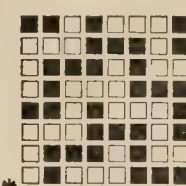
1 Black 14 „ „ „ „ „

1 „ 14 „ „ „ „

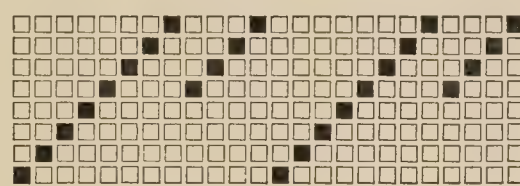
Crimson silk (knob twist.)

Fancy Woollen Trousering.

No. 427.



* Design.



Draft.

Warp:—

9 ends Claret 20 skeins woollen.

1 end Green 40 „ twisted to Orange, 40 skeins, at 20 runs

1 „ Claret 20 „ woollen. per inch.

1 „ White silk waste, 20 skeins.

5 ends Claret 20 skeins woollen.

1 end Black 30 „ twisted to Green silk, knob twist.

3 ends Claret 20 „ woollen.

1 „ Green and Orange Twist as above.

1 „ Claret 20 skeins woollen.

1 „ White silk waste, 20 skeins.

Woven:—

1 pick Claret 20 skeins.

1 „ Green and Orange twist.

1 „ Claret 20 skeins.

1 „ White silk waste 20 skeins.

3,072 ends.

48 „ per inch.

48 picks „

4 ends in a reed.

12's slay.

64 inches wide in the loom.

56 „ when finished.

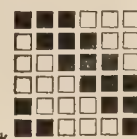
Finish bare and soft.

20 ozs. to the yard.

Mantle Cloth.

No. 428.

2,496 ends.



* Design.

39 „ per inch.

32 picks „

3 ends in a reed.

13's slay.

64 inches wide in the loom. Straight Draft.

56 „ when finished.

Clear finish.

24 ozs. to the yard.

Warp:—

4 ends Black 2/24's woollen, 10 runs per inch.

1 end Black 40 skeins twisted to White, 40 skeins, at 20 runs per inch—this thread twisted to 30 skeins Black at 6 runs per inch.

1 „ Black 30 skeins twisted to Mid Grey, 30 skeins, at 10 runs per inch—this thread twisted to 60's White silk at 8 runs per inch.

4 ends Black 24 skeins twisted to Mid Grey, 24 skeins at 10 runs per inch.

1 „ Fancy twist as before.

1 „ „ „

Woven:—

4 picks 2/24's Black woollen.

1 pick Claret 40 skeins twisted to White, 40 skeins, at 20 runs per inch—this thread twisted to 30 skeins Claret, at 6 runs per inch.

1 „ Crimson silk 60's twisted to Green silk 60's, at 20 runs per inch—this thread twisted to 20 skeins Black, at 8 runs per inch.



MACHINERY & TOOLS, & C.

A New Sheep Shearing Machine.

A new machine for the rapid shearing of sheep has been brought out in Australia, by Mr. Wolseley, which, in point of effectiveness, will prove a boon to large raisers of sheep in that country and wherever it may be introduced. Numerous tests of its capabilities have been made, all with the greatest success. A short time ago, a public exhibition of its utility was made at Eureka, at a large sheep rearing establishment. A number of sheep were first shorn by the hand shears generally in use, and the wool was cut as closely as possible; afterwards, the machine was brought into play, and it removed from $\frac{1}{2}$ lb. to $\frac{3}{4}$ lb. of extra wool, which it was found impossible to cut off by the closest cutting by hand. A trial was then made by machine alone, and this was so successful that the sheep were shorn of their wool as close as the hair upon horses. The process was carried out in from three to four minutes, the average per sheep being $3\frac{1}{2}$ minutes. By the use of the machine, it is calculated that, on a large station, not less than £1,000 will result to the rearer from one season's cutting. The trials hitherto have been so successful that the machine is likely to be in general use both on large and small stations.

Patented Fabrics.

A NEW DRESS MATERIAL.

This invention, which was recently patented, is for the manufacture of dress fabrics, whereby a strong and light material is produced; it consists of the combination of camel's hair or the hair of the Vicuna or Cashmere goat, either separately or in combination with wool spun into yarn for the weft, which is woven into, and combined with, a silk warp, the fabric being finished with the loose long hairs of the weft upon the surface of the piece. The combination of the above-named weft with the silk warp produces a new, light, yet strong material, soft to handle, the short hairs or down of the weft, combined with the silk warp, forming the body of the fabric, but the loose ends of the long hairs lie on the surface of the fabric. The piece is dyed in the usual manner, giving to the body of the same a dull appearance, but, in finishing, the fabric is not singed or cropped, thereby leaving the loose ends of the long hairs, which have a bright appearance, on the surface of the cloth, thus relieving the otherwise monotonous appearance of the fabric. In finishing goods composed of silk warp and the weft of wool or goat's hair, either separately or combined, the face of the fabric has hitherto been cropped or singed to remove the loose ends of the long hairs that would otherwise lay on the surface, thereby making the face of the fabric smooth.

IMPROVEMENTS IN MANTLE FABRICS.

This patent relates to certain improvements in the manufacture of fabrics used for dress goods and mantles, whereby a certain effect is obtained by the combination of a loop yarn warp and a loose or soft twisted weft. Hitherto, the effect obtained by this improvement has been produced by the introduction of loop yarn warp with loop yarn weft, the loops on such being produced by three threads requiring three operations on the frame, whilst the loose twisted yarn is produced by two operations. The fabric is woven by an ordinary loom, and the warp is of cotton, or of similar non-shrinking material, with loop yarn in such positions as required by the pattern; the weft is of woollen, and some portion, for the plain part of the check, is ordinary, but for the raised portion of the pattern, loose or soft twisted yarn is introduced, which may be produced by an ordinary twisting frame arranged with two sets of delivery rollers, between which the threads of yarn pass, one series of threads passing between one set of rollers, and the other threads between the other set; the rollers being so speeded that one set delivers about double the length of the other, the extra length being twisted around the centre thread, thereby producing a loose twisted yarn. When the fabric is woven, the loops of the warp are upon the face of the fabric, and, on passing it through the fulling machine, the weft shrinks, and in doing so loops are formed on the surface of the fabric by the extra length of thread of the loose or soft twisted yarn, thereby producing the same effect as if loop yarn had been used as hitherto for the warp and weft.

AN IMPROVED METHOD OF FORMING DESIGNS OR FIGURES ON WOVEN FABRICS BY WEAVING.

Designs and figures are produced by weaving in various ways, and the object of this patent is carried out by the employment of warp threads twisted in opposite directions—that is to say—one warp is twisted right handed, and the other left handed, and these two warp threads are arranged when weaving side by side, and are alternately right hand and left hand twisted warp threads up to the end of each series. An ordinary "dobby" is employed in connection with the loom, and it is arranged to lift a series, or a number of series of threads (the number varying according to pattern) which are alternately right and left hand twisted threads, the first of one series commencing—say with a right hand twist, and terminating with a left hand twisted thread, whilst the adjoining series of threads would be

vice-versa—that is to say—the series would commence with a left hand twisted thread, and terminate with a right hand twisted thread, and the next adjoining series would be like the first illustration, and so on, one after another, the change of twisted thread in each series showing a line of demarcation, and in all, and every series of threads, the first and last threads are opposite twisted warp. Goods composed of the peculiar warp herein referred to, and manufactured in this manner, whilst in the grey state, will, when dyed, show the pattern intended to be produced. The above method of selecting the warp threads would only produce checks, plaids, diamonds, diagonals, and other geometric figures, but to produce flowers, or other ornamental designs, jacquard cards or other pegging mechanism would be required instead of an ordinary "dobby." In this method of weaving, the warp is thrown on the face of the cloth, and the weft at the back, or, in some cases, part of the weft is thrown on the face of the cloth to vary the pattern.

EMBOSSSED FABRICS.

Embossing textile piece goods has met with much attention during the past few years, and has been the subject of numerous patents. The invention before our notice has for its objects an improved arrangement of blocks for, and method of, producing the pattern on embossed fabrics, where various widths and lengths of the same pattern are required, in a more economical manner than hitherto. When the borders of large articles, such as table-covers, curtains, &c., have been embossed, it has generally been the practice to make use of one block for the corners of the pattern, and one or more blocks, say, for the portions of border connecting those corners; thus, an article embossed in this manner has to be subjected to pressure several distinct times (for example, where there is only one corner block and there are four corners to the pattern—the article must be subjected to pressure four distinct times), and, as it is very difficult to obtain equal heat and pressure for these several operations when applied at different times, the pattern is generally more distinct in one part of the article than in another, and the portions subjected to pressure at different times differ in appearance; in addition to this defect, it is almost impossible to adjust the fabric so that the pattern produced by the block used, say, for the portions of border, exactly joins and matches the pattern produced by the block used, say, for the corners, and, unless these portions of the pattern join and match exactly so as to conceal the point of juncture, an imperfection is caused in the fabric. In order to avoid these defects, it is very advantageous to operate with one block containing the whole of the pattern, in order that the whole of the fabric may be embossed at one operation, as, by this means, equal heat and pressure can be obtained throughout the whole of the fabric, and imperfections from bad joinings are avoided. The blocks which have hitherto been constructed are, however, very costly, and, as a different block is necessary for each size of a set of table-covers, curtains, &c., the expense of producing a set of several sizes of such goods is very great. This invention has for its object the obviating of the disadvantages of embossing in several operations, and, at the same time, of rendering it unnecessary, when the whole fabric is embossed at one operation, to have a separate or distinct block for each size of a set of table-covers or curtains, or similar articles of one pattern. For this purpose, the improved blocks are constructed in sections, and what may be termed a built up embossing block is used to produce the required pattern. The pattern on the block is so formed and arranged upon sections, and the various sections are so fitted and held together, either by being screwed upon a plate of iron or other suitable material, or otherwise secured close to one another, that no joinings are visible in the pattern when the fabric is embossed. The sections, when built up and secured together, form, as it were, one block, containing the whole pattern to be embossed on the fabric, and is embossed at one operation, an equal heat and pressure being obtained throughout the whole surface operated upon.

Alizarine in Wool Dyeing.

Dr. Knecht gives the results of several experiments, which he instituted on a small scale, showing that several alizarine colours can be dyed very nicely upon wool, by mixing the mordant and the pigments in the same bath, that is, without the necessity of a separate mordanting. Wool dyed by one operation with three per cent. of bichromate potash and ten per cent. alizarine paste gave just as good results as when performed in two operations. In order to obtain strong and uniform tones, it is necessary to operate cold for a time, and then to raise the temperature gradually to boiling, at which it is to be retained until the end. Dr. Knecht obtained equally good results by the use of tin. The dye-bath was completely exhausted by using:—

	Per Cent.
Chloride of tin	4
Oxalic acid	2
Alizarine paste.....	10

The colour resists the light thoroughly, but darkens in the fulling with soap, similar to other tin and alizarine colours. Iron salts answer the purpose well when used with:—

	Per Cent.
Sulphate of iron	10
Oxalic acid	4
Alizarine paste.....	10

The wool dyes dark violet, which resists the light well, but loses its colour in fulling. According to Dr. Knecht, alum does not

operate in the same manner as other mordants. No good results could be obtained by boiling the wool with alum, cream of tartar, and alizarine in one bath. It may be anticipated that when this alizarine dyeing method in one bath can be performed on a large scale, it will result in a more extensive employment, by the wool dyer, of this pigment, as well as of the pigments related to it.

Nobel Method of Separating or Collecting Greasy or Fatty Matters from Spent Soap.

A novel method of separating or collecting greasy or fatty matters from spent soap liquors, and the like, has been patented in France by Schroers of Bockum. The novelty consists in the use of a freezing machine, or the ordinary apparatus for making ice artificially. The compartments of the machine are filled with the acid emulsion, or fat and water, as it exists in the precipitating pits; a bar of wood is fixed in the centre of each compartment, which is to serve as the support of the frozen mass; the liquor is then frozen solid. The blocks of frozen stuff are suspended by the wooden bars in a warm room over sieves or sieve cloths; upon thawing taking place, the water flows easily through the sieve, leaving the fatty matter in a half solid granular state, which does not quickly melt together, and lets the water pass through. Next, the fat is placed in sacks and pressed, it passes through the meshes of the cloth, leaving behind mechanical impurities; the cake left in the sack still contains fatty matter, which may be dissolved out by appropriate solvents, as benzine or carbon disulphide.

The Education of our Commercial Men and Artizans.

In connection with the Queen's Jubilee, it is extremely gratifying to note that, in many of the industrial centres of the United Kingdom, efforts are being made to mark the occasion by gifts which will have a permanent value, not only for the present generation, but also for those to come. In some of the towns of Lancashire and Yorkshire, where technical education has not hitherto existed to any appreciable extent, institutes are being either projected, or money is being offered for the purpose by private individuals, in such sums that the benefits to be derived from putting the latter to practical use, will not be lost sight of. The formation of these industrial institutes has now become an urgent necessity, as, judging from speeches made daily upon the question, our manufactures, even with a sound technical education, will have a hard fight to hold their own with our Continental neighbours in the future. There is no doubt, as Mr. Mundella says, that we should be far better prepared for the industrial competition we have to face at present, and shall probably have to face far more in the future, if our men of business were to stipulate that every apprentice should attend such educational classes as are open to him and calculated to advance his knowledge of the science of the industry in which he is engaged, or, if he is destined for commercial employment, that he should thoroughly master one, if not two, of the modern languages. It is impossible, with the reports of our Consular Agents before us, to doubt that we are daily doing ourselves material injury by not being able to push business, and to correspond with foreign customers in their own language. While the Germans push their way into every country, and do not fail to address the natives at their own doors, and in their own language, we are far too content to stay at home and trust to foreign agents to represent us. This may have done well enough while we had a practical monopoly of the market, but it will do so no longer. We must learn to speak the language of our customers, and we must be prepared to push our goods in person. If we do not, our business will go to those who will, and already there is a certainty that the Germans are doing what we have left undone. The English Consul at Odessa writes:—"The English commercial traveller is rarely to be met with here, and, when he does put in an appearance, he finds it difficult to do business through his ignorance of foreign languages." Mr. Howard Vincent, speaking of his experience in Scotland Yard, writes:—"I tried in vain to find an Englishman who could write even official French decently, and eventually had to have

recourse to a Belgian, and then to a young Dutchman, who wrote faultlessly in four languages." The Commissioners of the Trade Depression, in their report, state that in the matter of education we seem to be particularly deficient as compared with some of our competitors, and this remark applies not only to what is usually called technical education, but to the ordinary commercial education which is required in mercantile houses, and especially to the knowledge of foreign languages. The reason of this deficiency is not particularly obvious. The presence of many excellent linguists among us shows that the English do not, as a nation, suffer from any special inability to learn foreign languages, if only they chose to do so. Doubtless it is, to some extent, due to the insular feeling which excited the anger of their fellows against the unpatriotically correct accent of Lord Malmesbury and his brother. Still more is it due to the practical monopoly of trade that we long possessed. So long as manufactured goods could only be got in England, foreigners learned English in order to be able to get the goods; but whatever was the case once, it is no longer so now. Practically, the difference between English and foreign goods has now resolved itself into a question of superior wear; and when the German commercial traveller pushes his goods in the language of the country, the advantage which this gives him turns the scale against the Englishman. Schools and colleges may or may not be altogether blameless in the matter; but, whatever may have been the case in the past, it is clear that modern languages are now receiving all the attention they are entitled to, and we are glad to see that the Yorkshire College has just added Spanish and Italian to its curriculum. The increase of our trade with Italy has been a marked feature of late years; and the desirability of Spanish, with a view to trading with the Spanish-speaking districts of South America, is now beginning to be generally recognised. In these countries, there seems to be a genuine opportunity for creating a new business, which may, to a great extent, make up for our losses in other quarters; while a little more energy may do much to regain for us the ground which we have already lost. There is no reason why English houses should not be represented abroad by as efficient agents as Germany, nor is there any reason why English merchants should not have in their offices as accomplished linguists as Holland possesses; and as far as the existing depression is due to our ignorance of foreign languages, the remedy is in our own hands.

The Trade of the World.

HINTS TO MANUFACTURERS.



FOR some months past we have given summaries of Consul's reports, and other information calculated to be of benefit to manufacturers in general. A contemporary has gone to the trouble of having short special reports forwarded from some countries to which British goods have hitherto been sent under certain disadvantages, and, in many cases, in small quantities. These reports are reproduced with the hope that the interests of our readers may be advanced.

THE MILAN SILK MARKET.—Our Milan correspondent writes that the supply of silk goods is very limited. But although that is the case trade is not at all brisk, except in cases where manufacturers are prepared to clear off their stocks at some reduction, in order to make room for the coming trade of the spring. In the present halt between the winter and the spring trades only a few new orders are coming in, and those at low prices. Business here again, as at Roubaix, is rather dull, and the amount of transactions small. There has been some little activity in organzines. While on the subject of Milan, we may remark that the Italian Government has promised to concede half the import duty on ninety-two consignments of machinery, to be used in the silk trade. The number of machines is 724, the greater part of which came from England, as regards the cotton, linen, and jute trades. But Germany, America, France, and Belgium also supplied part of the new machinery.

A HINT FOR NOTTINGHAM.—We hear from a German correspondent that the German silk houses in Tabriz are pressing the French closer than ever in the silk trade. Nottingham, however, does not seem to have got hold of this market. In Northern Persia, the Elberfeld silk factories have driven out the Lyonesse goods. In the same market, Germany has obtained a monopoly of the trade in coloured silk and cotton goods—a trade which has hitherto been entirely in Austrian hands.

FRENCH COMPETITION IN BOLIVIA.—A French correspondent informs us that a French Consul-General is at once to be stationed at La Paz. This action on the part of the French Government, which has already settled the basis of a treaty of commerce with Bolivia, is expected to result in considerable extension of French trade in a country where the English and the Germans have acquired a preponderance commercially. The Bolivian

Congress, by the way, has just voted 5,000,000 paistres in order to construct a high road from Tarija to Oran, in the Argentine province of Injuy.

THE USELESSNESS OF CIRCULARS.—From more than one quarter of the world where new markets are in the process of being developed, we hear complaints that British houses are far too ready to content themselves with the mere issue of circulars and advertisements. Advertisements certainly have their uses, provided they appear in suitable newspapers, and are strengthened in other ways, such as placing a considerable number in the hands of an enterprising house. But merely to take at random a foreign directory and address circulars to every name that appears in the book is an absurd and useless waste of money. A foreign Consul in Japan, for instance, complains very bitterly that the business houses of the nation which he represents are throwing away their money partly in sending circulars to commission houses, and partly in sending inquiries to diplomatic and consular agents. We have often said that we shall be happy to give what information we can about a given market, provided no further responsibility is incurred than that of certifying that from personal knowledge or from sufficient inquiry, we are convinced that a given house is solvent, energetic, and reliable. But there is no possible object to be gained by writing to a consul, as too many houses in this country do, asking him to place them in communication with a house which is likely to put a given kind of goods on the market. As a general rule, consuls object to recommend any one house for reasons which will readily commend themselves to every man of business. But in the case of French, German, and Belgian agents, they generally endeavour to do what they can for the members of their different nationalities who apply to them. The result is said to be uniformly unsatisfactory. The legation or the consulate incurs a considerable amount of trouble in giving the sought for information, a correspondence ensues between the diplomatic agent and the parties interested, and it is very rarely indeed that any business follows, and when any transactions do occur they are of a very small amount. It is not sufficient to exhibit a desire to sell a particular product for which probably there are plenty of offers from all parts of the world. The chances are, too, that the man desiring to open up a new trade cannot find ready to his hand a house acquainted with the commodity he has to sell, and it is necessary that there should be some kind of personal introduction which certainly is not to be obtained through a consular or diplomatic source. Of course, the best way would be to pursue the method adopted by the Germans, who send out young men who have no particular future before them at home, and after some years return home to become the natural agents of the mother houses in the East. In default of this, manufacturers should apply to us, or to others, who may be equally well informed for further advice about given markets.

TRADE IN NORTH AND CENTRAL AFRICA.—Attention is being more and more directed to trade outlets in North and Central Africa. A French traveller, who has just returned from Southern Oran, on the confines of Morocco, reports that the prospects of a large business in all kinds of European manufactures are daily improving, and that these hopes would be realised on the opening of adequate railway communication, notwithstanding the nomad character of the tribes. Morocco, however, is an empire which is rapidly crumbling, and in these days of colonial expansion, it is inevitably destined to come under the sway of some civilised power. In the opinion of the explorer to whom I refer, English, German, Spanish, and Italian influences are, nevertheless, silently at work, not only on the coast, but as far as possible in the interior. English manufacturers and merchants should be upon the alert to secure a portion of the trade which is certain to be done with Morocco and other portions of North and Central Africa in the not distant future.

SILK AND COTTON GOODS IN ASIA MINOR.—There is, in Asia Minor, a growing field for silk and cotton goods. We are told that rough silk is imported to Beyrout from Shanghai, Hong Kong, and Broussa, to be worked up in this province. The quantity amounts to about 950 bales from Shanghai, and a similar quantity from Hong Kong. As regards Manchester goods, the most important item among the imports are those Manchester goods which include grey T cloths, grey and white shirtings, water twist, Turkey reds, woollen yarn, prints, and handkerchiefs. The amount of imports of these goods has steadily advanced year after year, and the advance is more than proportioned to the growth of the population. English manufacturers, therefore, in this class of goods, hold their own in the Beyrout market, in spite of Turkish competition, but they make no decided advance. Woollens are almost entirely imported from Germany, the goods being cheaper and better coloured; while the patterns are more in variety and also more tasteful. Cloth and coloured yarn are also brought from Germany and Switzerland, but the total trade of these two countries in this class of goods does not amount to more than 10 per cent.

SILK AND COTTON GOODS IN EGYPT AND TURKEY.—A circular has just been issued by the Egyptian Government, advising the fellahs to restrict, as far as possible, the sowing of cotton this year, purely because of the fall in prices, which rendered the production of this crop unsatisfactory last year, but chiefly because of the extreme exhaustion of the soil in recent years. In this connection we may observe that it is very remarkable how rapidly Austria-Hungary is catching up England in the Egyptian market. Gold and silver thread, for instance, is exclusively exported into Turkey and into Egypt by this country, and by Germany and Switzerland. As for silk stuffs, those sold in Turkey come mostly from France, and they are sold at from 3f. to 20f. per metre. Very little comes from Italy, and what does come is of an inferior quality. Pronounced colours and sprig and flower designs are in great request in the Egyptian market, in which very much the same state of things prevails. Among other Austrian imports are dress silks and ready-made clothing and furniture. The latter trade is one which could be greatly developed, seeing that the Arabs are discarding the Oriental style of

furnishing, and are fitting their houses more and more in European fashion. A number of Austrian agents have recently been working the cloth market very vigorously. The demand is chiefly for "imperial namsit," and "eböeuf" cloth, at prices from 9f. to 9½f. per metre for pieces 140 centimetres wide. In men's ready-made clothing, Austrian makers are supreme. As regards growth and production of cotton, it should be remembered that the surface of land under seed has been steadily growing for several years. At the beginning of the last season, the temperature was favourable to the plant which had suffered, however, a little from the caterpillar, the destruction of which is neglected by the grower, with the result that the production was diminished. English manufacturing houses have complained bitterly of late of the deterioration in the textile quality of the Egyptian fabric. This is chiefly due to the carelessness of the fellahs in selecting seed, which they often purchase of an inferior quality, and, in a measure, it accounts for the desire of the Egyptian Government, somewhat to diminish this year the production of cotton, and to increase that of wheat and other articles of food.

FOREIGN COMPETITION IN CONSTANTINOPLE.—Our consuls are never weary of informing us that British traders are rapidly losing their ground in Turkish markets, and, undoubtedly, to a certain extent, there is truth in the observation. The mischief is not, however, irreparable. We have only now received from Constantinople the Turkish trade returns, which have just been issued for the year 1885. The Turks are not so dilatory as the Russians in issuing their commercial statistics, but still they never display undue haste. From the figures before us, we gather that, from the month of March, 1885, till the corresponding month of 1886, the importations amounted to £T20,000,000, equal to more than £18,250,000. The value of the exports was about £T12,000,000, or something over £11,000,000. The countries which figure at the head of the list, as regards the imports, are England, Austria, and Russia. For the present, we may observe that some of the most popular textures in Turkey came from Dison. Vervies stuffs, properly so-called, and cloth goods, are too good for Turkey; what is wanted are articles containing wool of inferior quality. Bed ticks, striped and checked, on white and grey grounds, mixed with cotton, are also freely sold. The merinoes of Belgian make count no less than 11 threads, while those from the town of Arras, in France, used to have occasionally six threads. These same merinoes are made in England with cotton weft. English cotton goods, such as prints, Mexican cloth, calicoes and lustres—only woollen dress goods, flannels, and silk striped stuffs, still retain their hold upon the Turkish market.

The Associated Chambers of Commerce.

The Twenty-Seventh Annual Meeting of the Associated Chambers of Commerce of the United Kingdom, commenced on the 8th instant, at the Westminster Palace Hotel, London. Sir B. Samuelson, M.P., presided over a full representation of delegates from the different chambers. The president, in moving the adoption of the report, congratulated the meeting on the marked change for the better in the condition of trade, which had arisen during the second half of 1886, the most striking feature being the iron trade, based mostly on the demand for the United States, there was also an increase of exports to the same place in articles of general commerce. Trade with India, Central and South America, was also increasing in woollens, cottons, and other articles in general use. As to the recommendation to seek new markets, the president thought that it was scarcely needed, but that it would be well to make greater efforts to accommodate our productions to the wants of those markets. After referring to other subjects, Sir B. Samuelson spoke of the necessity for secondary education, and hoped that the bill for local government would confer on local bodies full powers to remedy existing deficiencies in commercial and technical schools, and stated that he, Sir H. Roscoe, and Professor Stuart, would call attention in Parliament to this matter. The president urged that it was of vital interest to the trade of this country, and of the world, that peace be maintained, and also that disputes should not arise between employers and employed, and the best means of preventing such disputes was by timely conciliation, as instanced by the Boards of Conciliation in the North of England. *Apröpos* of the Jubilee Celebrations of Her Majesty's reign, he said that in the half-century the imports of grain and meal had increased 1,000 per cent., rice 1,200, wool, &c., 1,300—Australian wool 9,000,000lbs. in 1840, to 400,000,000lbs. in 1886. In exports coal had increased 2,200 per cent., metals 700 per cent. To Australia the value of exports in 1837 was less than £1,000,000, but in 1886 they amounted to upwards of £25,000,000; to India and Ceylon in 1837 £3,600,000, and in 1886 to £31,500,000. Giving some figures to show the marvellous developing of our mercantile marine, the chairman concluded his remarks by endorsing the proposed Imperial Institute, providing it was placed in the *very heart of that great city*. With that exception, he believed the scheme had been unanimously adopted. As our space is very limited, we will omit many important subjects discussed at the meetings, and refer briefly to the resolution on technical education moved by Mr. Swire Smith, which was to the effect that, in order to secure the more efficient training of those intended for commercial and industrial pursuits, there is urgent need for the establishment of public secondary schools, where a superior technical and commercial education may be obtained; that the

Government be urged to make grants for the promotion of, and for proficiency in, commercial and technical education (including manual industry) in a similar manner to those now made for science and art; that local authorities be empowered to establish, maintain, and contribute to secondary commercial and technical (including agricultural) schools and colleges; and that a memorial embodying the resolution be presented to the Government by a deputation of the association. In moving the resolution, Mr. Smith said that, in order to maintain her position, England must, in the words of Professor Huxley, organise victory—she must place herself in such a position as to defy competition. We must not allow ourselves to drop behind our competitors; and to do this we must improve the quality of our productions. Machinery had been developed to a very great extent, but comparatively little had been done for the education of the workmen. Ready as Governments had proved themselves to adopt the latest improvements in matters relating to the arts of war, the same alacrity had not been shown in regard to things useful in time of peace. However important it might be to maintain our military and naval supremacy, it was still more necessary to insist on the doing of everything possible to maintain our supremacy in the arts of peace. The training required to bring our workmen up to the required standard could only be obtained by a properly-organised system of technical instruction.—Mr. Jacoby, M.P. (Nottingham), in seconding the resolution, suggested that the association might form the nucleus of a company for the promotion of technical and commercial education.—Mr. Howard Vincent, M.P., said he had recently returned from a visit to see the principal commercial colleges of the Continent, and he would like to point out that the existence of those colleges was, to a great extent, due to the efforts of merchant associations, and not to Government aid. He thought that if in England they waited until the Government gave them a grant, they would probably have to wait for a long time. The present time was eminently fitted for taking action in the matter.—Mr. Mundella said he was one of those who advocated the promotion of commercial and technical education at a time when the necessity for it was not so apparent to many people as now. On his accession to office, about seven years ago, he obtained the appointment of the Commission on Technical Education. To anyone who desired information on this subject, he could recommend no more important and valuable source than the evidence and report of that Commission. They emphasised the necessity for technical instruction; and the testimony thus adduced was fully borne out by the evidence and report of the Royal Commission on the Depression of Trade. While England had her vast natural resources and her prestige, she thought she had an impregnable position, and might defy competition. But it had been discovered that besides natural resources, there were intellectual and mental resources which, when properly developed (as they were developed by some of our competitors), were almost as valuable as natural resources. Mr. Howard Vincent had expressed a belief that in this matter they must not look to the State for aid. He could not agree with that view. At present our education was controlled by the State only as to two parts—the elementary education and the university education—all between was chaos. There was hardly a country in Europe in which intermediate education of every description was in so discreditable a condition. If the industrial forces of the country were to be recruited, it must be not from any one class, but from the best brains of the nation. The principal endowments of the country devoted to the education of the middle class were, to a large extent, expended on a form of education which was of very little use to those receiving it. What was wanted was an education which would adapt the people for the work of life, and to get that education they must begin with the elementary schools. What was to be accomplished could only be accomplished by organised effort on the part of the Government—giving to local authorities the powers advocated by the resolution before the meeting. He hoped that at no very distant date he should be able to support a similar motion in the House of Commons.—Mr. Hughes (Sheffield) said that Mr. Howard Vincent was not opposed to Government interference, but thought that they should not wait for such interference. He was of the same opinion, and suggested that pressure should be brought upon the Universities to induce them to establish a tripos in modern languages and subjects of immediate use in commercial life.—The president pointed out that at Oxford it was possible to take a degree in modern languages. The resolution was carried unanimously, and the meeting adjourned.

The Mexican Silk Industry.

The *Bulletin du Muse Commercial* draws attention to the great importance attaching to this branch of industry, which promises to become a most valuable article of export, provided proper attention is paid to it. There are such vast quantities of mulberry trees in the Mexican Republic, that from the cocoons 100,000 lb. of silk might be produced, being double the quantity consumed in Mexico. It has been proved that the climate of Mexico is quite as favourable to the cultivation of the silkworm as that of China. At Tetela a large number of mulberry trees were recently planted, and at Ixmiquilpan most of the inhabitants devote themselves to the silkworm culture; there is every probability of an increase in the number of cultivators. The disposal of the production appears not to meet with any difficulty. During the year 1884 the United States bought abroad raw silk for the supply of

their factories to the extent of 56 million dollars in value. An idea of the importance of silk-weaving in the United States may be formed from the fact that New Jersey alone occupies upwards of 14,000 persons in 84 factories. Philadelphia possesses also numerous establishments; besides, in a good many other towns, *e.g.*, Chicago, Patterson, Sarantoum, &c., a very large quantity of silk is consumed. Although the United States make great efforts towards the culture of the silkworm, Mexico need not fear anything as regards the sale of the produce. In California and Louisiana the cocoon crop has produced five millions of dollars; the United States cannot, however, rival Mexico in this respect. Labour is in fact dearer by far in the United States; the lowest daily wages there is one dollar, whilst in Mexico it is 25 centavos. It is asserted that the silk produced in Mexico, samples of which have been sent to England, is by far superior to that imported from China and Japan. The Mexican Government have also commenced to regard the rising silk industry as a most important matter with reference to exportation. The State of Puebla has issued a decree according to which a premium of one piastre per kilo. of cocoons obtained in the State is to be allowed for the first year, and four reals per kilogram for the two following years. Moreover, the State concedes exemption from every taxation, and a subvention of 5,000 piastres to the first silk factory which shall be established in the State.

According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the four weeks ending Saturday, January 29th, was 356. The number in the corresponding four weeks of last year was 324, showing an increase of 32. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, January 29th, was 942. The number in the corresponding four weeks of last year was 921, showing an increase of 21. The number published in Ireland for the same four weeks was 65. The number in the corresponding four weeks of last year was 83 showing a decrease of 18.

ODDS AND ENDS.

Wool from British Columbia has now found its way into the Montreal (Canada) market, but it is said that the first consignment will not show a profit in consequence of the high costs of carriage.

A Japanese manufacturer has been granted a patent for the process of making paper from sea-weed. The product is said to be almost as transparent as glass, to receive different colours readily, and to imitate perfectly ancient glass.

An exhibition of industry and science is to be opened in Brussels on the 1st of May, 1888. The project is promoted by the Belgian Government. An international telephone exhibition was opened in the same place last month.

All the British houses doing business with Rotterdam, who have any doubt about the characters of their customers, should apply to the local police, who, we are informed, have drawn up a list of individuals to be avoided by every honest trader. It is a very long list of gentlemen carrying on what is neither more nor less than a "long firm business."

A prize of 50,000f. has been offered by the French Minister of Education for a discovery rendering electricity economically applicable, in the shape of heat, light, chemical action, mechanical power, transmission of messages, or treatment of disease. M. Bertrand, of the Academy of Sciences, is appointed chairman of the committee of jurors.

It deserves to be known, as showing the development of the carpet industry in Germany, that F. A. Schütz, of Berlin, has received from Pope Leo XIII. an order for a costly carpet, intended to be used in connection with the coming papist feast, to be held in the Vatican, Rome. The style of the carpet will be Romano-Gothic, and will be carried out in Smyrna material. Similar commissions have always gone before to either Paris or England.—*Kuhlow's Review*.

We are requested to state that the British Union is an association formed to forward the commercial federation of the empire, in order that, by the transference to our own colonies of the food custom which we now fritter away on protectionist States that decline to deal with us in fair exchange, we may enhance and forward the development, and so create, within the limits of our own empire, expanding markets for our industrial products, and replace those in foreign States that are slipping through our fingers. Inquirers can receive every information on application to A. Morris, Organising Secretary, Royal Exchange, Manchester.



Receiving Orders.

De Zuniga, J., and Barbadillo, J. (trading as J. de Zuniga and Company),
1, Heddon Street, Regent Street, woollen merchants, High Court of
Justice in Bankruptcy.
Statham, J. (trading as Thorp and Statham), Dowley Gap, near Bingley,
Yorkshire, stuff finisher, Bradford Court.

Adjudications of Bankruptcy.

Ackroyd, W., 31, Charles Street, Bradford, fancy stuff manufacturer.

Dividends.

Hirst, S. H. (trading as George Hirst), 5, Quebec Street, Leeds, woollen
manufacturer, 1s. 8 1-16d. (first and final), 32, Park Row, Leeds.
Lister, S., Park Mill, Foundry Street, Halifax, Yorkshire, worsted spinner,
3s. 4d. (first instalment of composition). Official Receiver's Offices,
Town-hall Chambers, Halifax.
Richardson, Hannah Lee (trading as W. and J. Richardson), Batley Carr,
Batley, Yorkshire, woollen manufacturer, 1s. 10 7-16d. (first and final),
Armitage, Clough, and Co., 23, John William Street, Huddersfield.
Underwood Brothers, Whitehall Factory, Nottingham, lace manufacturers,
2s. 1d. (first and final), Official Receiver's Offices, 1, High Pavement,
Nottingham.
Whitaker, W., Whitaker, H., and Jackson, J., Spring Hill Shed, Burnley,
Lancashire, cotton manufacturers.
Wylde, J. L., and Blaxland, H. (trading as Wylde and Blaxland), 33, St.
Paul's Street, Leeds, Yorkshire, woollen manufacturers, 4s. (first),
Offices of J. W. Close, 32, Park Row, Leeds.

Dissolutions of Partnership.

Ashton, F. W., Parkinson, T., and Kinch, W. S., 59, Portland Street, Man-
chester, calico printers.
Barran, J., Barran, A., Brooke, H., and Wilford, E., Carlinghow Mills,
Batley, Yorkshire, woollen cloth and blanket manufacturers.
Broughton, A., and Broughton, G. W., Littlewood's Buildings, Hudders-
field, cotton merchants.
Playne, P., Playne, C., Playne, C. M., and Playne, A. H., Dunkirk Mills,
near Nailsworth, Gloucestershire, woollen cloth manufacturers.
Simpson, J., Mitchell, T., and Simpson, A., Ledgard Bridge Mills, Mirfield,
Yorkshire, woollen manufacturers.

PATENTS.

Applications for Letters Patent.

Actuating doffing comb of carding machines. E. Gaunt and W. Firth, Bradford.	15th Jan.	640
Automatic reversing gear for burl dyeing machines. E. Wood, Halifax.	24th Jan.	1,048
Bowls or rollers for calendering. E. Platt, Manchester.	6th Jan.	175
Clearing apparatus for ring spinning and doubling. J. Vaughan and J. Walker, Manchester.	31st Dec.	17,111
Cotton twisting. W. Hardcastle and J. Bentley, Halifax.	13th Jan.	531
Driving belts. S. Rowbottom, London.	31st Dec.	17,019
Dobby or shedding mechanism for looms. R. Livingstone and J. Skinner, Glasgow.	8th Jan.	308
Dispensing with check strap of looms. J. Marshall, Halifax.	10th Jan.	346
Dobbies. W. Hoyle and G. Burbury, Manchester.	10th Jan.	347
Dyeing unspun textile fibres. G. Jagenburg, London.	11th Jan.	443
Doffer cleaners for carding machines. A. M. Clark, London.	18th Jan.	793
Dyeing or otherwise treating textile materials. J. Walker, Halifax.	19th Jan.	818
Dobbies. C. Catlow, Halifax.	20th Jan.	883
Driving belts and pulleys. W. L. Purves, Wimbledon.	21st Jan.	996
Dyeing. A. Smith, Bradford.	26th Jan.	1,222
Expansion rollers or drums for levelling yarn on beam. J. Holt, London.	10th Jan.	336
Fancy pile fabrics. G. Chivalla, London.	1st Jan.	36
Forming slivers of jute and other fibres. H. H. Lake, London.	10th Jan.	386
Fulling, milling, scouring, and felting woollen, &c, materials. H. Ainley G. W. Tomlinson, London.	22nd Jan.	1,026
Grinding and adjusting carding engine cylinders and flats. J. Bullough, Accrington.	12th Jan.	484
Guiding the sliver in the sliver box in connection with carding engines. W. Lawton, Halifax.	15th Jan.	658
Holding flax, &c., during scutching, &c. J. McGrath and E. Manisty, London.	13th Jan.	572
Hearth-rugs. J. Wilson, Halifax.	15th Jan.	653

Hand and machine, coloured and variegated laces. A. M. Hart, London.	27th Jan.	1,287
Jacquard card junching machines. E. Daveniere and J. R. Hancock, London.	7th Jan.	300
Jacquard looms. E. Edwards, London.	13th Jan.	566
Joining of belting and appliances therefor. S. Wheelhouse, Halifax.	24th Jan.	1,059
Lace or open work fabrics. J. Y. Johnson, London.	31st Dec.	17,148
Looms for hosiery, &c., and apparatus therefor. J. Mercer, Blackburn.	1st Jan.	18
Looms. H. H. Lake, London.	11th Jan.	461
Looms. J. Lambert, London.	14th Jan.	607
Lubricating parts of lace-making machinery. J. O. Alexander, Glasgow.	21st Jan.	931
Looms for chenille and other fabrics. R. Boyce and E. Lepainteur, Glasgow.	25th Jan.	1,118
Looms. J. Hanson, Bingley.	27th Jan.	1,289
Loose and fast reed motions of looms. H. Preston. J. Lewis, J. Bennett, and F. W. Jepson, Halifax.	26th Jan.	1,215
Mounting and lubricating comb motions for carding engines. G. and E. Ashworth, Manchester.	5th Jan.	144
Measuring fabrics. J. Elliott and E. J. Arnold, Leeds.	26th Jan.	1,217
Mechanism for counter shafts for driving machinery. W. Fortune and F. H. Bentham, Bradford.	20th Jan.	913
New and useful improvement in belting. A. H. Reed, London.	11th Jan.	435
Operating dabbing brushes for combing machines. J. Holmes and J. Robertshaw, Halifax.	4th Jan.	84
Printing in colours. W. H. Turner, London.	31st Dec.	17,160
Preparing pile fabrics for dyeing and finishing. O. and E. Drey, F. J. Simpson and E. Platt, Manchester.	1st Jan.	2
Picking arms for looms. G. Malcolm and A. Johnston, Glasgow.	10th Jan.	356
Printing or marking designs for embroidery, &c. G. Downing, London.	13th Jan.	568
Picking bands and sticks. W. Wilkinson and L. Holden, Preston.	27th Jan.	1,296
Rugs and mats. E. T. Essex, London.	18th Jan.	778
Raising fibre or nap of cloth, and apparatus therefor. F. Laycock, London.	25th Jan.	1,158
Roving, or bobbin, or fly frames, and similar apparatus. E. Dervien, J. Van Der Zee and J. Fayollet, London.	26th Jan.	1,253
Spinning and winding jute, and other fibres, applicable to roving machines. A. McCulloch, A. Carrie, and D. Ogilvie, Dundee.	10th Jan.	339
Sewing leather belting with belt laces. Messrs. Tullis and Mackie, Glasgow.	11th Jan.	421
Stretching and twisting silk, &c. W. Stannard, Leek.	12th Jan.	487
Shuttles. P. and D. Turner, Manchester.	20th Jan.	864
Stopping motion for running slide doubling frames for cotton, &c. J. Hartley and W. Widdop, London.	20th Jan.	889
Shuttle tongue for shuttles. A. C. Smethurst and J. Holt, Bolton.	20th Jan.	874
Securing eyes for guiding threads in textile machines. W. D. Cliffe and T. Shackleton, Bradford.	21st Jan.	946
Split drums or pulleys. A. C. Wells, London.	27th Jan.	1,316
Temples for looms. Messrs. Lupton, Accrington.	17th Jan.	718
Tension pulleys for spinning and analagous machines. J. Wilson, Bradford.	18th Jan.	755
Velvet or velveteens. J. Cook, Eccles.	25th Jan.	1,119
Washing, soaping, dyeing, and dunging woven fabrics. W. Birch, Manchester.	6th Jan.	174
Winding the warp or other material for listing or edges of pieces of woollen, &c. T. and S. Barron and J. Chambers, Birstall.	7th Jan.	238
Weaving and apparatus therefor. E. N. M. Hepworth, Manchester.	7th Jan.	252
Winding thread. J. Keats, London.	12th Jan.	518
Woven fabrics—method of treating for the production of patterns thereon. F. A. Gatty and J. Leemann, Manchester.	15th Jan.	639
Weaving and cutting fancy double piled fabrics and apparatus therefor. H. B. Broadhurst and E. Smith, Manchester.	19th Jan.	828
Washing and scouring wool, &c. W. Cook, London.	26th Jan.	1,263
Woven and other driving belts. J. Higginbottom, Liverpool.	27th Jan.	1,282

Patents Sealed.

15,365	15,385	15,411	15,448	11,149	11,980	15,547
15,669	15,727	15,791	15,809	15,833	15,834	1,113
11,234	12,702	15,683	15,953	16,041	564	9,276
10,806	16,091	83	11,993	132	181	306
12,320	11,845	15,540	256	265	359	360
8,853	11,467	11,795	258	580	11,129	12,987
12,988	15,493	617	705	780	781	1,026
1,952	2,666	10,476	13,013	13,098	15,496	449
759	6,537	13,287	13,325			

The Journal of Fabrics

AND

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		Original Design for Tapestry or Printed Cotton Antimacassars.	

Notices.

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IMPORTANT NOTICE.

We beg to thank our friends for the generous support which they have extended to us, during more than five years, since this Journal was established. We have, in this period, given a great number of designs for every class of fabric, and as regards the designs for ornamental fabrics, we have hitherto stood alone, having, in this branch, had an entire monopoly amongst the Textile Journals of the world. In designs for Mantle Cloths, and in those for Ladies' and Gentlemen's clothing materials of every variety, including Worsted, Tweeds, Cheviots, &c., we have always endeavoured to be in the front rank, keeping as nearly as possible to the leading styles for each changing season. To enable us to do this with accuracy, most of our designs are produced in cloth before being published. To render this department of our Journal as valuable as possible, we have decided to give each month, commencing with this issue,

WOVEN SPECIMENS OF FASHIONABLE CLOTHS,

the Designs for which will be found in the usual place in our Journal. This is a feature hitherto only carried out by the proprietors of one Continental publication, which is issued at a high price, and, in undertaking it ourselves, we are conscious of the great expense we shall incur. We therefore ask our Textile friends to give us their active support, in order to render the experiment—which we shall try for one year—a complete success.

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Foreign Trade Reports from Her Majesty's Consuls.

We again give extracts from Consular reports in the hope that they may be of service to many of our readers:—

CHILE.—SANTIAGO.—Consul Thomas writes:—There is a vast field for the employment of British capital in Chile, in the establishment of numerous industries, which would not only pay, but pay well. Chile possesses a natural motive power in its various rapid rivers, which would have been a fortune to its inhabitants long ago, but for the inherent indolence of the people. There is only one woollen cloth factory in Chile. It is established in Santiago, and does a small but profitable business. But the cloth is much inferior to British goods. There is room for half-a-dozen of these establishments, the raw material being plentiful in Chile and the Argentine Republic. There is not a single cotton manufactory in the country; cottons of the best, and also of inferior quality, are obtainable in Peru and Central America, the larger quantity of which is to-day sent to England and France, and to be returned in its manufactured state, the freights of both voyages, commissions, insurances, &c., being a dead loss on the article, which has, in consequence, to be sold at a much higher price than its value to leave a profit. Twenty other similar industries might be mentioned, but the foregoing examples will suffice to indicate to British capitalists, and others interested in enterprise abroad, what may be accomplished by the introduction of capital, machinery, and work-people, to establish native manufactories. Special privileges are granted by the Chilean Government to enterprises of this nature, and they may be obtained by any one who guarantees the fulfilment of the conditions stipulated in agreements entered into with the object described. One of those privileges is that foreign artisans, so introduced into the country, enjoy all the advantages granted to ordinary emigrants. A few attempts have been made by the Chileans themselves to establish native industries, but they have done so with the belief that, with first-class machinery alone, the desired object could be accomplished. They have, of course, failed, because the principal element in the manipulation of the raw materials, of the machinery, and in the production of the manufactures, viz.—the skilled workman, has been left behind.

TURKEY.—ERZEROU.—Consul Davies, after speaking of the quantity of coarse calico woven for native use, states that the piece is 19½ inches broad and 18 feet long, and this year costs 8½d., but the price varies with the price of the cotton grown in the province, and this year was ½d. dearer, as locusts inflicted some damage on last year's crop. It may be estimated that nearly 1,400,000 pieces are annually woven; the looms could probably produce much more, were it not that the ill-dressed native cotton is used. But this industry is declining, and the demand for British "yelken-bez" sailcloth increasing. The Consul further states that until 1872 British printed handkerchiefs obtained some sale among the Kurds, but in that year Swiss manufactures entered into competition, and by the superiority of their designs, coupled with the lower rates at which the handkerchiefs were offered, and the fact that the British article would not resist water, the Republic almost monopolised this branch of trade. Switzerland now annually supplies £9,000 value of these handkerchiefs. There are three sizes, measuring 34 by 32, 30½ by 26½, and 24½ by 22½ inches, which cost respectively 3d., 2d., and 1½d. each (55, 37, and 28 paras). About 50,000 pieces of muslin, worth £1,400, and varying in breadth from 26 to 40 inches, and in length from 20 to 24 yards, are yearly imported to Erzingan from Manchester. The muslin is there cut up and printed with European dyes applied by hand on blocks of wood, with the pattern cut in, dipped in the dye bowl. The handkerchiefs sell from 30 to 50 paras (1½d. to 2½d.) each. and I understand the colours last better than those of the Swiss handkerchiefs. The Kurds, however, prefer the more elaborate flowery patterns of Switzerland. During the last two years, cotton flannel has been imported, and is growing in favour with the inhabitants, especially of late; it now penetrates as far as Arabkir and Kharput. The first quality of this flannel is 25½ inches broad and about 60 arshins long (the arshin 26½ inches), selling at 6½d.; the second 25½ inches by 60 arshins, at 6d.; and the third 31½ inches by 40 arshins, at 5½d. There is also a new Russian cotton cloth, which the inhabitants are beginning to use in place of manoussa. It is made in all colours, and in pieces of 96 arshins' length. The arshin of the first quality, measuring 23½ in breadth, costs 7½d.; of the second, 25½ inches broad, 5½d.; of the third and fourth qualities, 21½ inches broad, 5d. and 4½d. respectively.

DIARBKIR AND MARDIN.—Mr. Boyajian reports as follows:—The number of looms in Diarbekir and Mardin for weaving the manoussas, as they are named in these regions, is about 700, producing weekly 6,000 pieces of 6 yards 3 inches in length, varying from 17 to 18½ inches in depth, and weighing from 16oz. to 17½oz. avoirdupois, of cotton twist of Nos. 16 and 20. The total annual production is thus more than 300,000 pieces, and British white and coloured yarns are consumed to the value of £18,000 per annum. The labour, i.e., dyeing, weaving, &c., costs about 8d. per piece. There is no special mode of packing in bales. The pieces are folded flatly in the length, the folds being 5 inches in width, so they may easily be packed in the same way as calicoes and prints. As to the weight of the bales, the strength of the transport animal must be taken into consideration, the usual weight of two bales carried by one camel being 4½ cwt., and that by one mule 3 cwt. The consumption of manoussa is very large. It is in universal use, and is worn by men and women, townspeople as well as peasants. There is every indication that the demand will continue to increase. The native cotton cloths are both durable and comparatively cheap; the colours are bright and mostly fast. I would, therefore, remark that the British manufac-

turer, if desirous to meet with success, will have to consider the three following points, viz.—the durability of colour, good wear, and cheapness: as the chief cause of the revival of the manufacture of native cotton cloths, which for some years was on the decline, is the large importation of prints of inferior quality from England. Merchants in this province having no direct business with Europe or England purchase their goods at Aleppo, and consequently have to pay higher prices for them. As it is essential that the goods should be disposed of here at the lowest possible price. I should think it would be advisable that the manufacturer should have an agent on the spot, who, besides disposing of the goods sent, might also from time to time advise his employer as to the tastes and requirements of the people.

MOROCCO.—TANGIER.—Consul White writes:—Morocco draws its supply of textiles principally from Europe, the home manufactures, with few exceptions, being comparatively insignificant. No machinery has as yet been introduced into the country, nor are there any large factories, such fabrics as are made being manufactured on rough hand-loom by peasant women in their huts, or by weavers who generally work a single loom, though in some of the largest towns, such as Fez, there may be some establishments where three or four looms are worked. Cotton goods are almost entirely imported from Manchester; there are, however, a few classes of goods that are made in this country, the principal of these being the towels which are in universal use among Moorish women, particularly of the lower classes. These towels are worn as head coverings, and also as skirts hanging from the waist. They vary much in pattern and quality, those known as Anjera towels are the most esteemed. The district in which they are made being small, the supply of these towels is necessarily very limited, and they always command a ready sale, though dearer than those manufactured at Rabat and other parts of Morocco. With the exception of a few towels made in Anjera, linen textiles are but little manufactured. The industry in woollen textiles is more considerable, as not only is the home market supplied with native manufactured goods of a certain class, but £23,000 to £24,000 worth are annually exported to Egypt and the Levant. The most saleable materials are nearly always made in pieces of certain standard sizes, viz.:—1. "Rukks," or "Kharka," measuring 10 feet 9 inches in length, by from 75 to 80 inches in width; this is made up into (a) the "Sulham," or burnouse, a hooded sleeveless cloak worn by the better class Moors, and also by the mounted soldier; and (b) the "Jellab," a hooded sack-shaped cloak with short sleeves worn by the peasantry and poorer classes. 2.—"Haick," measuring from 18 feet to 21 feet 6 inches in length, by from 64 inches to 86 inches in breadth, the usual size being about 19 feet 6 inches by 80 inches. This is worn in the piece as an outer garment draped over the entire figure, after the manner of the Roman toga. The lighter and finer materials are worn by the wealthier Moors, whilst the stouter materials are worn by women of all classes when out of doors. The "Haick," contains silk bordering, and ranges up to £5 per piece in price. It may perhaps not be out of place to mention here that, whereas the cloths formerly imported into Morocco were almost exclusively of British manufacture, those now imported are principally of German origin, the only exception being in the case of that known as "army cloth," which is still brought from England. This change is to be accounted for by the fact that, in former years, the Moors were willing to pay high prices for the fine English cloths that were then supplied to them, but, during the years of famine and general poverty, they could no longer afford to pay the same prices, and cheaper German cloths were introduced into the market, and have since succeeded in establishing themselves to the exclusion of the finer English qualities which they are made to imitate. The local merchants also prefer importing cloth from Germany, as they are allowed a credit of four months without interest, whereas, when purchasing in England, no credit was formerly given; but I understand that the merchants in England now give credit on an account current, but charge interest. As there are some £30,000 worth of cloth imported annually into Morocco, it may perhaps be thought worth while for British manufacturers to endeavour to recover this market.

JAPAN.—TOKYO.—Mr. Longford states that in consequence of the excessive dampness, and sudden changes which characterise the climate of Japan, there is a growing demand for flannel. The class of flannel most likely to win favour with them is one of soft and light texture, smooth surface, and with patterns of a very fine check, the straight and transverse lines of which should, however, be of different colours, or else of finely drawn lines only. Large checks, plaids, plain mixtures, or very wide broad stripes meet with little or no favour among them, and often prove quite unsaleable, even though offered at a much lower price—amounting sometimes to a difference of as much as 20 to 30 per cent—than flannels of exactly the same quality and texture, but of a more popular pattern. This, at least, has been the experience hitherto, and though there is always a strong taste for new and fancy designs in regard to flannels, as well as in piece goods, both cotton and woollen, of every other description, Tokyo traders are of opinion that the rule above stated will continue, and that it is improbable that any flannel unless its pattern, however varying in minor details, generally complies with the above rule, can be largely or profitably disposed of in Japan. The price which Japanese retail purchasers will be willing to pay for flannel may be fairly stated as from 35 to 45 silver dollar cents per yard, and if these goods can be imported into Japan and sold by the retailers in Tokyo at that rate, a very large and increasing demand for them may be confidently expected. The Japanese, who can afford a higher price than this, are so limited in number, that it would not repay English or other European manufacturers to make special endeavours to consult their tastes. There is also another, even more essential, requisite which will have to be observed if a permanent trade is to be created; that is, that the flannel supplied must be durable and good wearing material. English flannels have now a high reputation among the Japanese for these qualities, and if it be maintained, the demand for them will increase. If, on the other hand, rubbishy materials, whether made entirely of wool or of cotton mixture, are sent here, they will, if of good appearance, no doubt be sold largely in the first instance; but as the Japanese are quick in learning what is durable and

what the reverse, and as they highly appreciate the former quality, the demand for English flannels, if buyers are disappointed in this respect, will die far more quickly than it will have grown, and their reputation once destroyed can hardly ever be recovered. In that case, the Japanese consumer will, in the future, only have to look to the factories that may be established in the country, in imitation of the Government one already existing at Senji, for supplying his necessary wants in this respect. Prior to the year 1880 there was, in several years, a very considerable import of flannel into Japan. I cannot here enter into the causes which brought about its decline to the low figures representing the amount and value of the import in 1880, but in that year the trade reached its very lowest ebb. In the following year, the whole import more than doubled, the increase being owing principally to an increased import of British flannel, a very good quality of which was laid down at moderate cost in Yokohama. It acquired considerable favour amongst the Japanese in Tokyo, though retailed to them at a considerable advance on the prices at which it was laid down in Yokohama, and there was every promise that a steady and progressive trade in it could be developed by the bestowal on it of even a very moderate degree of attention. This fact, however, was realised by the German importers, who sent home patterns with full instructions for making up, &c., when goods were produced, of even superior appearance to the English made, for the Japanese markets. The latter, seeing that these materials looked quite as well as the English, and that they were much lower in price, bought them largely. "But," says the Consul, "the result, which will always occur when the Japanese consumer of piece goods is deceived in quality, has already come about in this instance, and if the English manufacturers are now willing to take advantage of the opportunity that is afforded to them, I can see no reason why they should not speedily create a considerable and increasing demand in Japan for their productions."

The best way in which to take advantage of the present opportunities is to send out here skilled experts in the trade, who could not only investigate its wants and prospects on the spot, but also actively and vigorously push the sale of the productions in which they are interested direct to the Japanese wholesale and retail dealers in Tokyo, personally visiting the latter, taking their orders immediately from them, and generally acting precisely as do commercial travellers in every civilised country in the world. I believe that this course cannot be too earnestly urged on manufacturers of flannel, of piece goods of every description, and of haberdashery and hosiery, for which there is now a large demand here. It would, of course, be best that such agents should be permanently maintained in Tokyo, but the experiment might, in the first instance, be tried temporarily, and the cost need not be very great; it would bear no proportion whatsoever to the ultimate profits which would follow the possible success of the experiment. Apart from the salary or commission paid to such agent, the necessary expenses incurred by him for a year should, at a very liberal estimate, be as follows:—

Return ticket available for one year by Pensular and Oriental	£
Company's steamers	140
Hotel Expenses for nine months in Japan, \$900, equal to ..	150
Wages for competent Japanese interpreter for nine months,	
\$270, equal to	45
Travelling and entertaining in Japan, \$1,000, equal to	166
Servant's wages, \$108, equal to	18

Or, allowing a large margin, say in round figures a total of £600 sterling. At the end of twelve months' residence here, the agent, if permanently maintained, and of fair linguistic ability, ought to be able to conduct ordinary business transactions without the aid of an interpreter, though such aid would be required for a few years more, when technical details were being discussed. If business increased, the services of one or two native clerks would also probably be found necessary, and a further expense (of perhaps \$100 per month) would have to be incurred for the hire of an office and storehouse. The latter, under circumstances as they still stand, would be absolutely necessary for receiving goods ordered from England on their arrival, and storing them until the buyer was ready to take delivery of them. Many Japanese merchants and retail dealers are unpunctual in observing their engagements as to time, and the whole business of English importers with them is carried on the strict principle of "cash on delivery." German importers have, I understand, in some instances, departed from this principle, but doing so is as yet attended with risk. That this experiment would be attended with success, I cannot of course guarantee. A commercial traveller pushing his business in the manner I have suggested must be prepared to find every possible obstacle thrown in his way by the whole class of native brokers in Yokohama, who now practically control all sales by foreign importers, and from the latter again he could, for two reasons, naturally expect no assistance; first, because he comes to interfere with their own business; and second, because the importers would fear to offend the native brokers, on whose favour their business largely depends. In recommending the experiment, however, both previously and now, I have not acted upon my own judgment alone. I have discussed it with several Japanese of high intelligence, both officials and traders, whose position and experience enable them to form opinions worthy of high respect, and with English residents in Tokyo, not engaged or personally interested in commerce, but with considerable knowledge of commercial matters, and they have spoken unanimously in its favour. One Japanese merchant here, a member of a firm that imports goods from England to the annual value of a million dollars, told me that every year they had visits from *French and German travelling agents*, to whom, though his firm, was anxious to do business only with England, finding, as they did, English manufacturers more satisfactory in every way to deal with than continental ones, they gave orders, "*just because they came.*" In his whole experience, however, he only remembered one British travelling agent—a linen manufacturer from Belfast—calling upon them in Tokyo. Specimens of flannels have been forwarded from Japan to Mr. W. Shaw, of Rochdale, who, after exhibiting them for a fortnight at the Free Library of that town, has sent

them to the Bradford Chamber of Commerce, where they may be seen by those interested in the manufacture. These samples are arranged in two volumes, nineteen of them are of German production, sixteen of English, one of French; there are also fifteen samples made at the Senji woollen factory, Japan, of which eleven are fancy and four are plain coloured flannel made for the War Department.

CHINA.—Consul Gardner of Hankow, in his lengthy and valuable report, makes many suggestions which, if carried into practice, would, we think, give very beneficial results, we subjoin a few of the most striking:—1st.—It would be well if there were a permanent museum in Manchester, in which our artisans could see all descriptions of made-up cotton products in vogue in each of the consular districts of China, and in the various stages of their manufacture from the cotton in the pod to the clothes, &c., made from cotton. In this museum might be exhibited a map of China, a short account of each consular district, an estimate of the number of inhabitants, principal towns, land and water routes, &c., by this means the requirements of the Chinese, as regards cotton textiles, would be fairly understood at home. 2nd.—Our manufacturers should ascertain the names of reliable British subjects at each of the treaty ports in China who deal in cotton textiles, and should communicate with them as to the best mode of pushing trade. 3rd.—That small consignments of fac-similes of native cloths should be sent to each of the treaty ports in China, care being taken to send to each port fac-similes of cloths in vogue at that port. 4th.—Such consignments might result in losses, but by watching markets and taking advice of experts on the spot, a profitable trade might spring up, and the first losses might be looked on as cost of advertising. 5th.—The system of periodical auction sales of English cotton textiles, now in vogue at Shanghai, might be extended to various other treaty ports. 6th.—Sales might be extended by means of commercial travellers and packmen in the interior; and specimens of our textiles and threads, might be taken by the native pedlars, of whom there are many, and it might be made profitable to them to sell our goods at a price to create a demand. 7th.—It would be well if more textiles were consigned direct from home to Hankow, and thus the charges and profit of Shanghai middlemen would be avoided. 8th.—It would be well if some of our manufacturers would visit China, and stay a short time at each of the ports, and make excursions into the interior; they could thus become acquainted with the various merchants, commission agents, &c.; they would be able to judge how and by what agents their business could be pushed; and they would see with their own eyes the taste of the people, the mode of conducting business, &c. 9th.—In case of our manufacturers making fac-similes of any of the native cloths, it would be well for them not to size them. It is true, our heavily-sized shirtings met a want for a cheap article not necessary to wash, wear, or dye, but they contracted the demand for our higher-priced goods by throwing on them the reputation of not being durable. 10th.—It would be well if our manufacturers of high-class goods wove their trade mark on each piece, stating its quality. The Chinese are great believers in "brands," or "chops," and when once a manufacturer has established a reputation in the country, goods marked with his brand will be more in demand, and will realise higher prices than goods equally good of unknown brands. 11th.—It would be well if an attempt were made to send out goods dyed to the taste of the Chinese (specially dark blue). The great defect of Chinese-dyed goods is that the colours are not fast.

ICHANG.—Consul Gregory advises our cotton manufacturers to turn their attention to the production of light materials suitable for the Chinese use, he suggests mosquito net as worth consideration, and says it can be bought at European stores in China, but it evidently has not come into much use among the Chinese. They use for their mosquito curtains, sometimes, (if of the higher class) a silk netting, sometimes a "grass cloth," sometimes a very loosely woven cotton stuff, sometimes mere "shirting," or calico. Our mosquito net is objected to as not durable and too transparent; it is also probably rather dear, under the present condition of the supply. A manufacturer disposed to try the experiment might aim to give strength, by the use of unbleached cotton and of a stouter thread, and comparative opacity by the same thickness of the thread, and by inducing a glazed or glittering surface which should reflect light, or a "watered" surface, or by printing the stuff with a pattern; things which, moreover, might commend themselves to the Chinese purchasers' taste. And he might also give the stuff the valuable character of non-inflammability by treating it with certain well-known chemicals, and might supply such chemicals, with printed directions, for renewing the preparation after washing.

The London Chamber of Commerce has determined to try what can be done, by an organisation of the commercial members of the House of Commons, to further the interests of the trade of this kingdom. It has consulted by circular those members of Parliament of all parties, and irrespective of political colour, who have enjoyed a commercial training, and the replies received to its enquiries have proved so unanimously favourable that a meeting will shortly be convened to discuss the best means of organising an Extra-Parliamentary Commercial Committee. It is proposed that this committee shall, at the commencement of each Session, consider the commercial measures before the House and select those which, in its opinion, are deserving of special support. Such measures might thus, with a larger aggregate of support than is at present obtainable, be passed through the House in greater numbers than at present. The proposed committee would, in fact, be equivalent to an informal Grand Committee of Trade, and would facilitate that combination of devolution, concentration and specialism, by means only of which, it is universally admitted, our present system of Parliamentary Government can be carried on.

The Prospects of the Cotton Trade.



IN reviewing the future of the cotton trade in the United Kingdom, Mr. John C. Fielden, contributes the following to a contemporary:—The shippers, merchants, and manufacturers of this country—in fact, all classes having a living interest in our commerce or agriculture, are scanning closely the recent slight improvement in trade to see if the symptoms denote such a revival of trade as will lead to prosperous times. So far as concerns one of our greatest industries—namely, the cotton trade—I venture to give the following outline of its position and prospects. It may be taken for granted that those who believe in successful foreign competition against Lancashire have abandoned all hope of a revival of the cotton industry, because we already produce cotton fabrics equal to five times our home consumption, and therefore if, as they say, we are failing to hold the first place in the markets of the world, what chance can there be of a profitable and extending business in these goods? A careful examination of all that appertains to our cotton manufacture and that of such countries as the United States, Germany or France, will certainly prove that England stands even higher now as a competitor than in the highly profitable period which closed just as the cotton famine commenced. To prove this position in detail would occupy too much space, but one simple fact may reassure the desponding. Since 1860, our cotton trade with the nations of Europe, restricted as it has been by high tariffs, has grown 70 per cent., notwithstanding the supposed growing power of Germany or France to compete with us in neutral markets, and the cry of the spinners and manufacturers of the Continent is for more and more protection against England. In considering, therefore, the prospects of a revival of the cotton trade, I leave the question of foreign competition out of the calculation so far as America and Europe are concerned. India alone has displaced us, and that only in the supply of coarse yarns to the far Eastern markets, which, like herself, have silver money by which to regulate exchange. If we had lost a large part of our trade, and this was the main cause of the long depression which set in 10 or 11 years ago, the successful competitor must have been doing, not only its usual business but, the part gained in competition from us. Will any one inform us where the cotton industry has been rollicking in leaps and bounds, while the cloud of depression has been almost unbroken here? The theory of over-production is much more generally put forth, than that of foreign competition, to account for the depression of trade. Over-production may exist in manufactures owing to under production of crops, or a special trade may die out through being superseded, but there cannot be over-production all round, and yet all our great trades, including agriculture alike with land or property, have been depressed, and the depression has been similarly felt all over the civilised world. In relation to the world's requirements in cotton fabrics, the following careful estimates show that there is great room for expansion. The entire annual output of raw cotton is now estimated at 11,000,000 bales, or 2,250,000 tons. Taking the population of the world at 1,140,000,000, this gives a little over 3½ lbs. per head to serve every purpose for which cotton is now used. Based on English consumption, where, owing to climate, woollen clothing is largely necessary, the world requires 30,000,000 bales of cotton, and if based upon its use in the United States, over 40,000,000 bales per year. It must be remembered that cotton is essentially the clothing for the myriads of India, China, and Africa, whose population numbers two-thirds of the human race. In the opening up of these markets, in the construction of better means of transit, and the development of their resources, we have the key to an unbounded expansion of the cotton and other industries. India now employs one-fourth of the factory workers, and from her alone came the increase of business which rendered cotton weaving profitable and busy in 1886, after years of heavy loss. China offers an almost unlimited field, and the statesman, who uses his term of office to enter into the closest and most friendly relations with that country for commerce and common defence, will give a great impetus to our industries, and at the same time solve a great military problem. In Africa, at the Cape, and in Egypt, we can expect a quick growth. Trade increases where each side

has growing equivalents to exchange. A settling down from barbarous manners to tillage, &c., and somewhat peaceful methods of government, must precede a large trade with any other part than the mere fringe of the Dark Continent. In looking for symptoms of revival, we naturally turn to the production and how the mills are engaged; but in searching out causes of improvement in the cotton trade, we have mainly to consider the nations who buy from us and not the home demand. At present (and for some time past) our machinery is in full work, under contract, and the cotton operatives fully employed. Taking the two branches—namely, spinning and weaving—together, the trade is about holding its capital, and earning some interest upon it. There are distinct indications that the world has overtaken, in consumptive power, the output of our machinery, because population has been steadily growing, while the extension of machinery, usual in profitable times, has, during the last decade of depression, been on a reduced scale. Looking at our exports in quantity (the truest test of growth), we find the foreign demand for our cotton fabrics as follows:—

	Total yards.	Annual ave.
1871 to 1875	17,608,000,000	3,522,000,000
1876 to 1880	19,360,000,000	3,872,000,000
1881 to 1885	22,457,000,000	4,491,000,000

These figures show a great and steady advance. From 1871-5 to 1881-5 it is simply an enormous increase. Yet the former was a prosperous, the latter a profitless period. Why? Certainly not from lack of demand or displacement by foreign competition. The year 1880 was the largest year of exports in these goods until 1886, and there is no doubt the world was put on short supplies from that year—namely, 1880—until just recently. Probably, the decline in purchasing power is traceable to the universal fall in prices. We shall most likely see an extending cotton trade, giving more and more employment, but the signs are that it will not be very profitable to the capitalists. Wages in this trade are, however, ten times the amount of profits on capital in ordinary times. It would be tolerably safe to predict that the exports will increase to an average 5,000,000,000 yards per annum for the years 1886 to 1890, or 42 per cent. more than in the period of 1871 to 1875, often referred to as the period of bloated prosperity.

British Trade in Bulgaria.

The following article from the *Yorkshire Post* is so replete with instruction and good advice to manufacturers that we give it in full:—Englishmen, who travel much abroad, are often compelled to ask themselves whether their commercial and manufacturing countrymen are not themselves, in some measure, to blame for the industrial depression which one hears so often and so feelingly bewailed. Whilst they clamour for the opening up of new continents, whilst they are eager for commercial adventures in the heart of Africa, or in the inhospitable plains of Thibet, are they not apt to neglect the markets which lie at their very doors, markets which do not, perhaps, appeal so vividly to the imagination, which certainly do not promise a short cut to fortune, but where, albeit, on a smaller scale, good and substantial business may be done? How is it, for example, that British trade is being gradually but surely elbowed out of the whole of South-Eastern Europe by the Austrian, German, and even Russian competitors? Or, to take only one striking instance, why is it that a little country like Bulgaria, whose growing prosperity has been so striking a proof of the ripeness of the Balkan nations for self-government that it has excited, in the most aggressive form, the jealousy of its former northern patron, has been entirely overlooked by the representatives of British industry, and abandoned, without being deemed worth a struggle, to the keener enterprise of Central Europe? Without going into the details of general trade, I would confine my observations for to-day to the following hard facts:—The Bulgarian Government spends on an average every year from £200,000 to £300,000 in contracts for army clothing and equipment over and above its expenditure for armaments proper. By far the greater part of this sum is expended in the purchase of cloth and linen for soldiers' uniforms. Not a farthing of that money, however, comes to England. In fact, no British firm has ever made a single tender for these contracts, which go to Brunn, to Waldenburg, to Landshut, to Constana, to Moscow, everywhere, in fact, except to our own industrial centres. It

would be an insult to British manufacturers to ascribe their exclusion from Bulgaria to inability to compete with continental firms. Nor are they excluded by any differential treatment. The Customs duties in Bulgaria are still levied under the terms of the commercial treaties between Turkey and foreign countries, which do not operate unfavourably against British imports; and, in regard to Government contracts, Customs duties are, of course, not levied. There is no reason for apprehending underhand dealings or unfair influences. Under a very stringent law, passed some years ago by the Bulgarian National Assembly, all Government contracts are given, and can only be given, upon tenders, of which notice is given and specifications are published in the *Official Gazette* at Sofia. Whatever influence the Government may exercise in such matters, *i.e.*, in cases where, all things being equal, the department concerned may give the preference to one out of several competitors, would certainly not under present circumstances be exercised to the detriment of British trade, as the Bulgarian Government is known to favour the extension of commercial relations with this country, being perfectly well aware that close commercial relations tend more than anything now-a-days, in England at least, to promote close political relations. Bulgaria is not one of those impecunious and financially exhausted countries where contracts are made in a hurry, and the question of providing money to defray them is relegated to the Greek Calends. It is true that for many years—in fact, ever since Bulgaria became an autonomous State—its budget has shown an annual deficit, but that is merely a superficial result of political circumstances. In many countries, budgets have been “cooked” to hide a deficit, but in Bulgaria, we are in the presence of the curious phenomenon of budgets that have been “cooked” in order to hide a surplus. The treaty of Berlin imposed upon Bulgaria the payment of an annual tribute to Turkey, and a share in the Ottoman national debt, which the Bulgarians, who had had no voice or interest in the expenditure of the huge sums borrowed by the Sultans from credulous Western financiers, were determined to reduce to the lowest possible expression. In order to be able to plead poverty—the strongest argument of all in such cases—they were careful not to allow the real prosperity of the country to transpire in their budgets. Hence the annual recurrence of bogus deficits. That the finances of Bulgaria were not in such a parlous state as her Ministers periodically described them to be, was proved in 1885 by the fact that she was able to provide for the expenses incidental upon the revolution in Eastern Roumelia, and the war with Servia, without contracting any indebtedness, and solely out of reserve funds gradually accumulated upon “annual deficits!” Her credit is indeed so good that, notwithstanding the difficult political crisis through which she is at present struggling with so much fortitude, she has found first-class financiers ready to take up her first loan, of one million sterling, upon terms which other states of older standing and far more weight would vainly crave for under similar circumstances. The greater part of this loan is, indeed, to be applied to reproductive purposes, namely, to the termination of the Great Trunk line of railway between Central Europe and Constantinople, which, among other things, ought to open up the Balkan Peninsula to British trade *via* the Mediterranean. The Foreign Office has furnished the Leeds Chamber of Commerce with details of past contracts in Bulgaria, which may help British merchants in weighing the expediency of competing for this year's contracts, specifications for which will shortly be published at Sofia. Tenders have usually to be sent in by some fixed date in May, and delivery takes place in the autumn at Varna, the sea-freight to which port ought to place English manufacturers at an advantage over their continental competitors, who must incur the heavy railway freight across Central Europe. The political situation in Bulgaria, the approaching completion of the Balkan railways, the fact that Bulgaria is about to enter into close financial relations with London, where the first Bulgarian loan will shortly be issued, conspire to render the present moment exceptionally favourable for British industry to acquire a permanent footing in the most progressive of the Balkan States. Will Englishmen lack sufficient enterprise to improve the opportunity, unmindful of George Eliot's well-known aphorism that, if the road to a certain place is paved with good intentions, it is itself walled and roofed in with neglected opportunities?

The Prospects of the Woollen and Worsted Trades.

The prospects of a continuance of a good trade in the worsted and woollen industries of this country are, at the present time, of a cheering character. During the past five or six years, some very great improvements in all departments of manufacture have been made, and this is owing, in a great measure, to the outcry, raised some time ago, that our manufacturers were clearly losing their hold on the markets both at home and abroad, through their apathy and want of technical knowledge in the various processes necessary in the production of their goods. Undoubtedly, this was in a great measure true, but with this knowledge before them, no time has been lost, and in many branches of manufacture they are again ahead of their foreign competitors and behindhand in few. Apathy has given place to increased, and almost feverish, energy to keep a hold on both the home and foreign markets, and efforts are continually being made to find new markets to which to send goods. Those engaged in the worsted and woollen trades of this country, both employers and employes, have much to congratulate themselves upon in the present steadiness of business. If the former are as a rule making less profits than formerly, owing to excessive competition, still they have to take into account the rise of foreign nations in industrial pursuits, and they ought to be glad that there is a profit to be made at all. As to the operatives, we may venture to assert, that at no time of British history have they, as a body, been in such easy circumstances as now. If those who are given to grumbling at their lot would only read of the position of the workman of fifty years ago, and compare their position at the present time with that of their forefathers, there would be fewer strikes than now occur from time to time. We have no hesitation in saying that the present year will be one of very great prosperity in this country—so many schemes are afoot for the keeping suitably of our Queen's fiftieth year of her reign, all of which must greatly benefit purchasers of goods, and, consequently, employers and employed. Of the legion of proposals brought before the public for the celebration of Her Majesty's Jubilee, none is likely to be of more benefit, in a commercial point of view, than the founding of new or the widening of the usefulness of existing, technical schools in the worsted and woollen districts. The necessity for technical instruction is now recognised as essential to the prosperity of our industries, and schools are springing up in various manufacturing towns.

The promoters of the scheme for founding a Technical School in Wakefield are on the look out for a site suitable for the erection of the building. The working "Men's Technical Association," the first of the kind in England, but, we hope, not the last, have undertaken to raise £1,000 towards the Trades School, and £200 towards the fees of workmen's children, or to provide scholarships for deserving students. The late Mr. Robert B. Mackie left to the School of Art Committee the sum of £1,000 and they had £1,000 in hand before then. To this may be added £500 promised by Messrs. J. Briggs and Sons and the amount for which the existing premises of the School of Art will sell. The Clothworkers' Company have all along been watching the movement with a degree of interest highly suggestive of a handsome contribution from that quarter, and the council of the School of Art are relying on a Government grant of £1,000, at least. Therefore, the promoters of the enterprise may be said to be sure of half the £10,000 which they think of expending, and that, too, without having made any general appeal. Of course, the new building, wherever it be, will serve the double purpose of an art school and a trades school, and will replace the existing institution. It is understood that the council which will regulate the suggested institute is to be as representative as possible. Not only will all the educational public bodies in the town and district have a voice upon it, but also the coalowners, and probably the miners of West Yorkshire may have their say. The Mechanics' Institute Committee and the Trinity Church Young Men's Society promise to merge their art and science classes with those of the new school, and to assist the venture in every possible way. It is hoped that the subjects to be taught in the trades school may be as wide in their range as the curricula of the best technical schools in Yorkshire. But if the highest branches of instruction are impracticable, it is thought that the cleverest students may

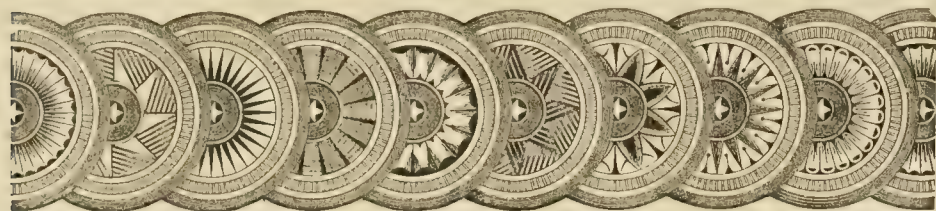
be passed on to the advanced classes of the Yorkshire College and the Bradford Technical School. From every point of view the scheme seems to be fraught with substantial advantages for people of all classes.

Dewsbury also is to have a new building for this purpose, and the scope of the scheme is to be extended. For some years past technical classes have been conducted in the Mechanics' Institution, where the accommodation afforded has been entirely insufficient, but the teaching has been unexceptionable. The examinations passed by the students received the attention of the Clothworkers' Company, and with characteristic generosity that body made the school grants, and also paid the railway fares of some of the more promising pupils, who availed themselves of the higher training at the Yorkshire College, between Dewsbury and Leeds. The local Chamber of Commerce have also given some countenance to the classes by contributing a donation or two. Otherwise there has been little substantial help. Now that there is a likelihood of the institution being put on a proper basis, a more generous disposition is being manifested. Messrs. Wormalds and Walker, woollen manufacturers, have devoted a part of a subscription of £1,000 to the object; Messrs. M. Oldroyd and Sons, Limited, have given the whole of a like sum; Mr. Mark Oldroyd gives a moiety of £500; and two other subscribers of £250 each direct that half of their contributions shall also go to found a Technical School. The Jubilee Committee have appointed a deputation to wait upon the managers of the Mechanics' Institution to ascertain whether they would be prepared to transfer that property as a preliminary step in carrying out the project. Meanwhile an appeal is being made for additional subscriptions. It is anticipated that, should the promoters be enabled to satisfy the Clothworkers' Company that a Technical School worthy of the district can be provided, that body, following its enlightened policy, will give further liberal aid.

Batley too is moving in the matter of founding a school, the subject being broached a few days ago at a meeting convened by the Mayor. Liberal donations have been promised, and, no doubt, the project will be carried out to a successful issue.

Commercial Education.

Sir Bernard Samuelson, M.P., President of the Associated Chambers of Commerce, and a member of the Commission which is now enquiring into the working of the Education Acts, writes a letter on the general subject of commercial education. He does not approve of the present attempt to establish such a high school of commercial education as appeared to be in the contemplation of Sir Lyon Playfair, M.P., because, so far as he had been enabled to gain information with regard to the so called commercial schools, they did not appear to have met with the success anticipated. But for commercial clerks and travellers, he considers secondary schools needed, like the Real-Schulen and Real-Gymnasium which are numerous in Germany, and in which modern languages,—with some Latin in the Real-Gymnasium—modern history, literature, the elements of natural science, mathematics, and drawing, are well taught at a cost of from £3 to £7 or £8 per annum. Sir Bernard attaches little importance to such special instruction in commerce as can be given in a school—he considers that the merchant's office, warehouse, and exchange, is the only school for special instruction in commerce,—but, in order that our young men may be able to profit by it to the fullest extent, the foundation should be thoroughly well prepared. Geography—as mere topography should not so much signify, but a knowledge of the countries of the earth, their climates, and productions, should be an essential. Arithmetic should include considerable practice in the decimal system as applied to money, weights and measures, and a thorough comprehension of the principle of proportion. Algebra need not be carried beyond simple equations, but a boy should be able to carry these to every ordinary problem of arithmetic. If he can do this, he will not require special instruction in book-keeping, which need only be given to young men and women educated in elementary schools, who are to serve in retail shops. An abundance of good and cheap modern schools should be established in every important town, and, for the support of these, localities should be allowed, if they chose, to tax themselves, with some assistance from the state.



ORIGINAL ✕ DESIGNS.

On our first plate will be found a design for Printed Muslin, which will look well if printed in a dull pale blue upon cream, or in a tan upon white, or in a salmon upon cream. A near approach to this latter colouring is given upon this plate. These light fabrics being not only cheap, but pleasing and effective, and easily adaptable for a variety of useful purposes, are in continual demand. This design has been drawn by Mr. R. T. Lord, 97, Park Road, Bradford.

Our second plate contains a design for Broché Velvet. It is the work of Mr. R. T. Lord, 97, Park Road, Bradford.

We give a design, on our third plate, which will be found useful by manufacturers of Tapestry or Printed Cotton Antimacassars. Of course, this pattern would be much enlarged when produced on cloth, and would gain in effect thereby. Mr. F. Layton, York Terrace, Akroydon, Halifax, is the designer of this pattern.



Wool.—Since the close of the last sales in London, wools in the metropolis have shown a fractional advance in price for the finer qualities, about 1500 bales having been sold during the past few days. In Bradford and the Yorkshire and Scotch district generally, there has been a fair consumption, and as stocks in the hands of staplers are getting low, and there is a difficulty in replacing them at current prices, wools are held for higher rates. For Botany wools, there has been more inquiry, and this has resulted generally in stiffer prices being paid for choice sorts. The state of the yarn market has not been satisfactory; buyers having offered lower rates, and spinners being unable to secure wools at a corresponding price, they have been compelled to refuse orders unless for the absolute purpose of keeping their machinery running. The export branch has not been of a cheering character, although inquiries have been numerous. The piece trade has shown but little improvement, the business done being of a miscellaneous kind, and the orders offered generally of small proportions, and at prices unsatisfactory. The demand for coatings from Bradford to the United States has ruled quiet, there having been a marked falling off in quantity.

Cotton.—The markets for the raw material have fluctuated slightly in demand as well as in prices, but, on the whole, the latter are fractionally higher. The aspect of the yarn and cloth branches has not changed materially from last month, the demand for the former having been slightly better, although, as regards an improvement in prices, there has been no perceptible difference, but spinners have held out for higher rates. Manufacturers, as a rule, have only bought yarns to fill little more than actual requirements, as they have found merchants indisposed to order cloth in any large quantities at prevailing prices. The demand for fabrics for the East has improved, especially for India and Japan, whilst the export trade to other countries has been rather below the average. The quantity of goods being made is still very large, and trade cannot be considered unsatisfactory, numerous new weaving mills are being projected in the Preston, Chorley, and Blackburn districts.

Woollen.—This branch of the textile trade has kept up well in nearly all departments. The lead has been taken, as has been the case for some time past, by the better classes of

worsted of a fancy nature. These are having a good run, and seem likely to keep in favour for some time to come. The tendency still is for neat patterns in stripes and checks, in which silk is as usual manipulated with good effect. The variety of patterns is larger, both in design and colouring. Medium and low class worsteds have sold moderately well, these also being of exceptional merit, when taking into account their quality. Tweeds, chevots, &c., of wools of good quality have met with much favour, and low goods for the clothing trade have also been greatly inquired for, whilst medium class goods have met with fair attention. The variety of patterns in these classes seems endless, manufacturers doing their utmost to produce novelties for each succeeding season. The heavy cloth trade has been quiet, but still the outlook is fairly cheerful, as large stocks on hand are the exception, goods having moved off well during the latter part of last year. Full time in most branches is still the rule, whilst many large firms are working overtime, and they have orders in hand that will last for some months to come. The woollen trade may safely be said to be the most satisfactory branch of any industry, at the present time, in the United Kingdom.

Linen.—Trade generally has improved in most branches. In damasks and other goods, in which designs form a leading feature, orders have been more numerous, and prices of a more satisfactory nature have been procured. In towellings, toilet cloths, and such like fabrics, there has also been a distinct improvement with better prices. Drills and sheetings have too participated in the amendment, and fair orders have been received. The flax trade has revived, and prices have shown a distinct advance, with above an average demand. The jute branches have been fairly busy, the demand both for the raw material and for the manufactured article, has kept up to the average of business for the past six months. Inquiries have been numerous, and prices have had a hardening tendency.

Lace.—There has been a falling off of the better feeling reported last month, although a considerable business has been done, but prices are still much against producers. The demand for curtains has kept up, but there is much room for improvement, as a large quantity of curtain machinery is idle, and the prospects of its being early put into work are not cheering. Cotton millinery laces have sold moderately well, both in plain and fancy colours. The demand for antique laces has fallen off, and the silk branches have been anything but active. A few specialities have been inquired for, but only in small quantities. The demand for bobbin and mosquito nets has fallen off.

Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the four weeks ending Saturday, February 26th, was 404. The number in the corresponding four weeks of last year was 388, showing an increase of 16, being a net increase in 1887, to date, of 48. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, February 26th, was 1134. The number in the corresponding four weeks of last year was 1092, showing an increase of 42, being a net increase, in 1887, to date, of 63. The number published in Ireland for the same four weeks was 73. The number in the corresponding four weeks of last year was 85, showing a decrease of 12, being a net increase, in 1887, to date, of 30.

The Belgian Minister-Resident at Tangiers, in his last yearly report, directs special attention to the success of the exhibition of Swedish export articles established in that port. Imitating the example set by Germany, the Swedish government has given permission to the frigate "Vouarès" to carry a sample collection put together by Swedish merchants, which was landed at Tangiers and arranged in a special warehouse. Most of the goods have already found buyers, and apparently repeat orders have been given, as the early arrival of another Swedish merchant vessel, with a cargo of iron and steel ware, furniture, candles, packing paper, agricultural implements, matches, &c., has been announced. The Minister recommends to his countrymen the imitation of the Swedish example, and anticipates considerable advantage, for Belgian trade, and also urges the creation of a regular service of steamers between Belgium and Morocco.



PRINTED MUSLIN

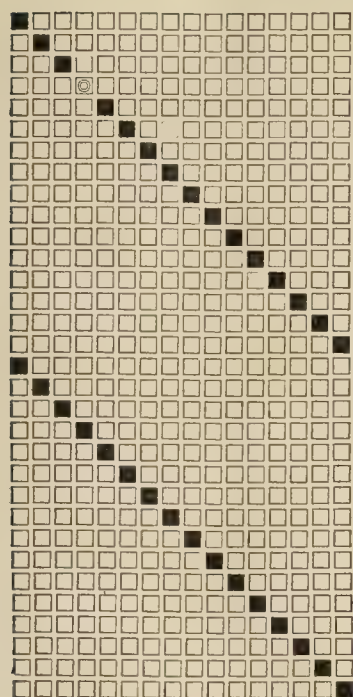


BROCHE VELVET



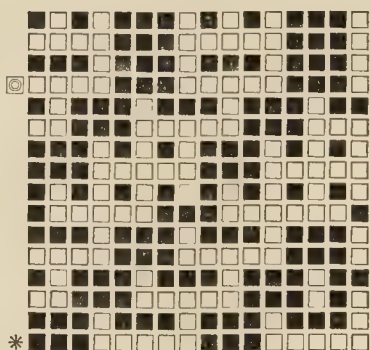


Worsted Suiting.



This is silk twist end.

No. 429.



* This pick is where the silk twist must be.

Design.

The following particulars give four different colourings:—

Warp:—

16 Olive 2/60's worsted.

3 Green „ „ „ twisted
to 90's silk Crimson.

12 Green 2/60's worsted.

16 Claret „ „ „
3 Black „ „ „ twisted
to 90's Orange silk.

12 Black 2/60's worsted.

16 Plum „ „ „
3 Black „ „ „ twisted
to 90's White silk.

12 Black 2/60's worsted.

16 Claret „ „ „
3 Black „ „ „ twisted
to 90's Orange silk.

12 Black 2/60's worsted.

Woven:—

16 Green 2/60's worsted.

3 Brown „ „ „ twisted to
90's silk Crimson.

12 Brown 2/60's worsted.

16 Claret „ „ „
3 Black „ „ „ twisted
to 90's Orange silk.

12 Black 2/60's worsted.

16 Olive „ „ „
3 Black „ „ „ twisted
to 90's White silk.

12 Black 2/60's worsted.

16 Green „ „ „
3 Black „ „ „ twisted
to 90's Orange silk.

12 Black 2/60's worsted.

5,376 ends.

84 „ per inch.

80 picks „

21's slay.

4 ends in a reed.

64 inches wide in the loom.

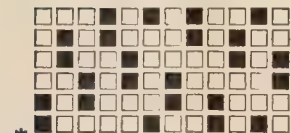
56 „ when finished.

Finish soft.

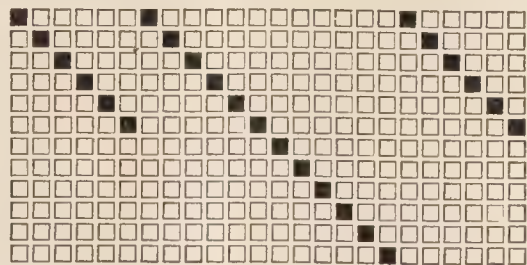
Weight about 14 ozs.

Worsted Trousering.

No. 430.



Plan.



Draft.

Warp:—

12 ends Black worsted 2/36's.

1 end Lavender silk 2/40's.

1 „ Pea Green worsted 2/36's.

8 ends Brown Olive worsted 2/36's.

1 end Pea Green worsted 2/36's.

1 „ Lavender silk 2/40's.

Woven all Black weft,
16 skeins woollen.

Finish clear and smart.

Weight 24 ozs.

3,584 ends.

56 „ per inch.

72 picks „

14's slay.

4 ends in a reed.

64 inches wide in the loom.

56 „ when finished.

Worsted Trousering or Suiting.

No. 431.



Design.

Warp:—5 ends Black worsted 2/30's } 4 times.
1 end White silk 2/40's }
5 ends Black worsted 2/30's } 2 times.
1 end Orange silk 2/40's }

Woven all Black worsted 2/30's.

4,096 ends.

64 „ per inch.

64 picks „

3 ends in a reed.

21½ slay.

64 inches wide in the loom.

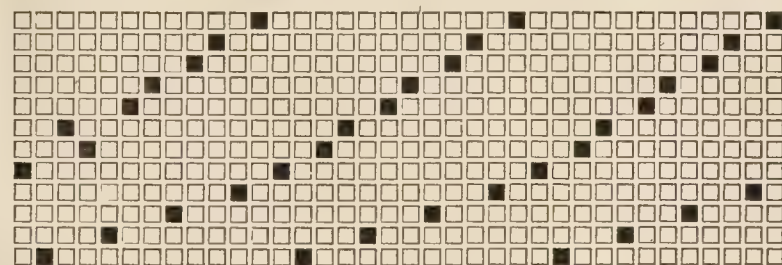
56 „ when finished.

Straight Draft.

Finish clear and smart.

Weight about 18 ozs.

Worsted Suiting.



No. 432.

Draft.

Face warp:—

2 ends Black worsted 2/48's.

2 „ „ 1/48's, twisted to
Green 1/48's.

Backing warp:—

1 end Black worsted 2/24's.

1 „ Green „ „

Woven:—

1 pick Black worsted, 2/48's.

1 „ „ woollen, 7 skeins.

1 „ „ worsted 1/48's, twisted to
Crimson worsted, 1/48's.

Face warp:—3,360 ends.

Backing warp:—1,680 ends.

72 ends per inch.

70 picks „

12's slay.

6 ends in a reed.

70 inches wide in the loom.

56 „ when finished.

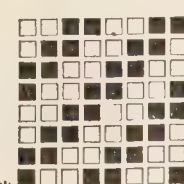
Design.

Finish clear, soft and smart.

Weight 24 ozs.

No. 433.

Warp:—



Design.

10 ends Black cheviot 2/18's woollen.

1 end „ 1/18's, twisted to steel
cheviot 1/18's woollen.1 end Black cheviot 2/18's, twisted to Black
worsted 1/30's, and Orange worsted 1/30's
made into a looped yarn.

Weft :—

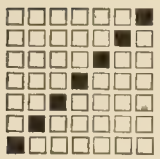
14 picks Black cheviot 2/18's woollen.
 1 pick Olive „ 1/18's, twisted to Claret cheviot 1/18's woollen.
 1 pick Black cheviot 2/18's, twisted to Pea Green worsted 1/30's, and Orange worsted 1/30's made into a looped yarn.

1,716 ends. Straight Draft.
 26 „ per inch.
 26 picks „ Mill to width.
 13's slay.
 2 ends in a reed. Cheviot finish.
 8 healds.
 66 inches wide in the loom. Weight 24 ozs.
 56 „ when finished.

No. 434.

Warp :—

6 ends Black cheviot 2/18's woollen.
 1 end „ „ twisted to Pea Green mohair 1/30's, and Olive mohair 1/30's, made into a looped yarn, slack twist.
 6 ends Mid Grey cheviot 2/18's woollen.
 Design. 1 end Black Grey cheviot 2/18's woollen, twisted to Black mohair 2/30's, and made into a looped yarn, slack twist.



Woven :—

6 picks Black cheviot 2/18's woollen.
 Draft. 1 pick „ „ „ twisted to Drab mohair 1/30's, and Crimson mohair 1/30's, made into a looped yarn, slack twist.
 6 picks Olive mixture cheviot 1/18's cheviot, twisted to Mid Grey cheviot 1/18's.
 1 pick Olive cheviot 2/18's woollen, twisted to Olive mohair 2/30's, and made into a looped yarn, slack twist.

1,176 ends.
 21 „ per inch.
 28 picks „
 7 healds. Scour clean and leave cloth bulky.
 8's slay.
 2, 2, 2, 1 in a reed.
 56 inches wide in the loom.
 52 „ when finished.

A woven specimen of No. 434 can be had by applying to H. and R. T. Lord.

Woollen Suitings.

No. 435. 2,398 ends.

36 ends per inch. Mill to width.
 36 picks „
 3 ends in a reed. Soft velvet finish.
 12's slay.
 68 inches wide in the loom. 22 ozs. to the yd.
 56 „ when finished.

* Design.

Straight Draft.

Warp :—

6 ends Black 2/30's woollen.
 6 „ Stained „
 6 „ Black „
 6 „ Stained „
 6 „ Black „
 5 „ Stained „
 1 end Crimson „

Woven :—

6 ends Black 2/30's woollen.
 6 „ White „
 6 „ Black „
 6 „ White „
 6 „ Black „
 5 „ White „
 1 „ Crimson „

No. 436.

2,048 ends.

32 ends per inch. Finish soft and mellow.
 32 picks „
 4 ends in a reed. Weight 24 ozs.
 8's slay.
 64 inches wide in the loom. Straight Draft.
 56 „ when finished.

* Design.

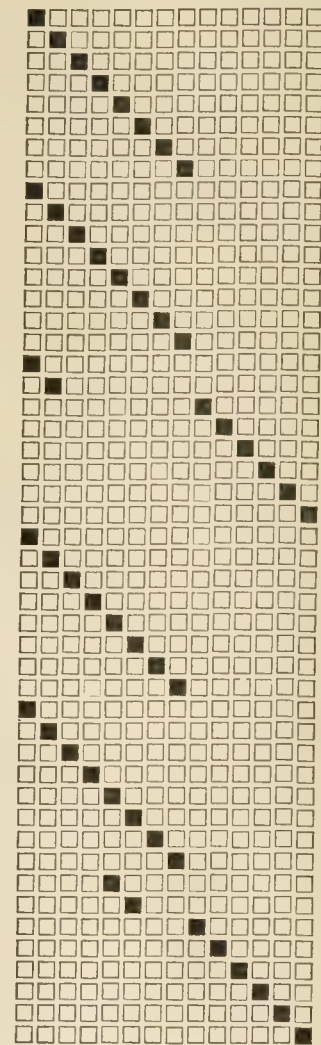
Warp :—

8 ends Brown 2/24's woollen.
 3 „ Olive „
 twisted to untwisted spun silk (rough).
 1 end Crimson 2/24's woollen.

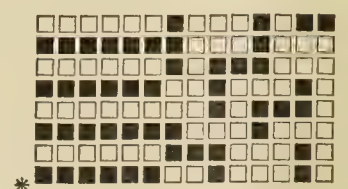
Woven :—

8 ends Black 2/24's woollen.
 3 „ Stained „
 twisted to untwisted spun silk (rough).
 1 end Crimson 2/24's woollen.

Woollen and Worsted Trousering.



No. 437.



Design.

Warp :—

2 ends Black, 40 skeins twisted to White, 40 skeins, 20 runs per inch, and twisted with Drab worsted 2/48's, at 4 runs per inch.
 2 „ Claret self twist, 2/40's skeins woollen.
 2 „ Fancy twist as before.
 2 „ Claret self twist, 2/40's skeins woollen.
 2 „ Fancy twist as before.
 2 „ Claret self twist, 2/40's skeins woollen.
 2 „ Fancy twist as before.
 2 „ Claret self twist, 2/40's skeins woollen.
 2 „ Fancy twist as before.
 6 „ Claret self twist, 2/40's skeins woollen.

Woven—3 picks Green, single, 20 skeins woollen.
 1 pick Fancy twist as warp.

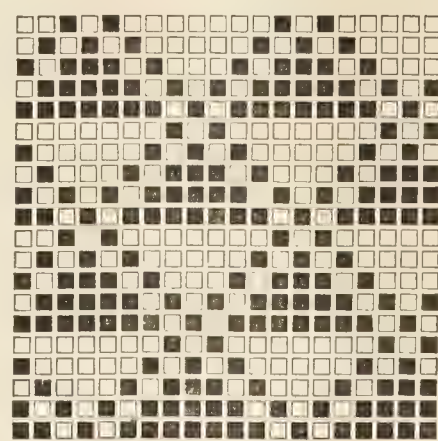
4,020 ends.

60 ends per inch. Finish clear and smart.
 56 picks „
 6 ends in a reed.
 10's slay. Weight 24 ozs.
 67 inches wide in the loom.
 56 „ when finished.

Nos. 435, 436 and 437 are winter patterns, and for which we have no woven specimens.

Cotton Dress Goods.

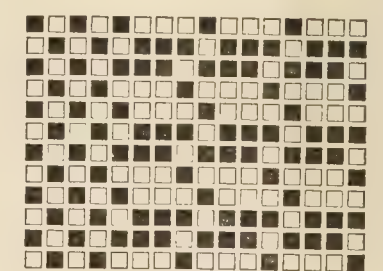
Fo. 438.



Design.

10 shafts.

No. 439.



Design.

44's sett. 16 shafts.
 10 picks per 1/4 inch.
 2/20's cotton soft twist for warp and weft.

We have seen woven specimens of above, and can, therefore, assure our readers that the designs are good and reliable.

MACHINERY & TOOLS, &c.

The Introduction of Electric Light into Mills, Weaving Sheds, &c.

During the past two years, considerable progress has been made in the lighting of cotton mills, weaving sheds, dye and bleach houses, &c., by electricity, and the new system of lighting is now being adopted by most of the principal manufacturers in the country. It has proved itself beyond doubt to be in every way superior and cheaper to the newest modes of gas, and other systems of lighting, where it has been given a fair test in comparison. Messrs. John Rylands and Sons, Limited, have been one of the first firms to adopt the new system of lighting on an extensive scale, having, after very careful consideration, decided on having their Swinton mill and weaving sheds fitted throughout. We give a few details of this installation.

1st, *The Generating Plant*.—This consists of one "Crompton" Wrought Iron Compound Self Regulating Dynamo of the improved type, capable of giving an output of 900 incandescent lamps, of 20 candle power each, at a speed of 700 revolutions per minute. This is one of the largest machines constructed, standing nearly 6 feet high, and weighing almost 4 tons. The dynamo is driven by a direct acting vertical engine, running at 63 revolutions per minute, the fly wheel of which is 14 feet in diameter, driving a counter shaft (by means of a 17 inch link belt) from which the power is transmitted to the dynamo by two 9 inch link belts (these belts were made by a firm in Glasgow, and weigh 7 cwt.), the total power at present developed is 85 H.P. Passing into the works, we enter the weaving department, which is divided into three sheds.—No. 1 shed, which has about 450 looms, is fitted with 226 lights, placed in rows, with one lamp to every two looms. Switches are provided to each of these rows, and any portion of the lights can be turned in or out by the overseer. The whole of the lamps in the shed are divided into four circuits, each independent of the other, and are controlled direct from the dynamo room.—No. 2 shed is fitted with 28 lamps, controlled from the dynamo room.—No. 3 shed is the next largest in the mill, having about 330 looms, and is provided with 168 lights. These are arranged similar to No. 1 shed, and are divided into four circuits, each controlled from the dynamo room.—Entering the next shed, where the winding, warping, doubling, and twisting work is done, we find it is lighted by 238 lamps, placed in rows. Each of these rows (as in weaving sheds) is controlled by branch switches, which enable any number of the lamps being turned in or out as required. The lamps in this shed are laid also in four circuits, each controlled from the dynamo room. In addition to the above, the dye-houses, warehouse, and packing and store rooms, mechanics' and joiners' shops, boiler yard, passages and offices are also lighted up, comprising a total of 790 lights altogether. Re-entering the dynamo room, the next object of interest is the switch board, which controls the lamps. This consists of solid polished slate slab, edged with polished mahogany. This is one of the largest boards made, and is fitted with 15 sub-main switches, and 15 sub-main safety fusible junctions for controlling the various circuits of lights, and with one main switch and safety fusible junction, which can control all the lamps in the mill at once. All these switches are of the new sliding form; underneath each switch is a small brass plate denoting what lights the switch will control. The board is also provided with a potential indicator by means of which the attendant can see at a glance what candle power the lamps are working at. The board and fittings are enclosed in a polished mahogany glass case. There are approximately 9 miles of wire laid throughout the mill and all are insulated with india rubber, cotton, braiding, ozokerite and compound. There are over 3,000 joints between wire and wire, each of which has been carefully made and well soldered, and recovered with similar insulation as on wire. The whole of the wires are enclosed in grooved wood mouldings, with the exception of the flexible lamp pendants. The installation has now been working for the last three months very successfully, not the slightest hitch having occurred, and is giving every satisfaction to Messrs. Rylands. One feature is particularly noticeable, viz.:—the purity and coolness of the atmosphere, combined with the clearness of the light as compared with the old system of lighting. The installation was erected under the superintendence of Mr. H. Bury, Electrician, 27, Arcade Chambers, St. Mary's Gate, Manchester, (for Mr. W. Acheson, 6, Hopwood Avenue, Manchester, agent for R. E. Crompton and Co.), and is fitted in accordance with the rules of the Phoenix Fire Insurance Company.

Paterson and Brooks' Weft Stop Motion.

During the past few years, many inventions have been patented for the automatic stopping of looms, when the weft breaks, or the bobbin runs empty. These inventions have been more or less practical, many have, through little imperfections in the mechanism, been failures, but these failures have been taken advantage of by other inventors, and the defects remedied. Some have not been reliable for all the various counts of wefts, and most of them have been too expensive to admit of them being extensively used, even though they had been satisfactory in other particulars. The utility of stop motions has long been apparent to those interested in the production of woven goods. The material used in weaving is costly, the power, also, is a serious item of expenditure, therefore an invention that prevents waste, and tends to increase the amount producible in any given time is of great benefit to the master, and as time is the workman's capital, whatever saves time to the weaver must

be of as much importance to him as to the manufacturer himself. In the preparation of the motion which we bring before the notice of our readers, previous defects have been kept in mind, and it has been the aim of the inventors to present a mechanism not possessing any of these faults. Messrs. Paterson and Brooks' patent is put on the loom at a reasonable rate; in its working, it is simplicity itself; it is reliable with all thicknesses of weft, the steady rise and fall of the finger preventing any stapling of such weft; it weaves thick woollen, fine worsted, and very fine silk all in one piece, without showing, in the slightest degree, any tendency to that very serious defect, and, with ordinary care, it cannot get out of order. In weaving without an automatic weft stop motion, or with one that is unreliable, when the weft breaks the loom goes on, and the best of weavers will often continue his work for a time without noticing the breakage; he must then take out his weft until he comes to the broken end. This sometimes causes a damage in certain makes, which would not have occurred had the loom been furnished with a reliable stop motion. The patentees guarantee a saving of from 25 to 30 per cent. in mending pieces. The advantages claimed for this motion have been so satisfactorily tested, that weavers, instead of objecting to their use, as was formerly the case, are anxious to have them applied to their looms. Full particulars may be had by applying to T. Brook and Co., Engineers, Queen Street, Huddersfield.

Improvements in the Method of Printing in Bronze, especially on Plush.

The above named improvements relate to the method of printing bronze, or bronze powder, on plush, in such a way that the bronze appears in a clear and pure manner on the material. Up to the present time, it has been an impossibility to print with this powder on any fabric, but, according to this invention, it can be done successfully in the following way. A plate is engraved to represent the drawing or ornament required to be printed, it is covered with a cold mixture of bronze powder and varnish, such as turpentine, copal or dammara lacquer, of the consistency of a tough dough, which is first spread on a suitable plate, and then transferred to the engraved plate by means of an india rubber roller. The engraved plate is passed over several times with the india rubber roller so that the mixture adheres, in a considerable thickness, to the plate. The engraved plate, thus prepared, is then pressed on the plush, which is placed on an elastic and porous material, such as felt, for instance, in a press heated to about 80° Celsius, and subjected to strong pressure. In this manner, the layer of bronze powder and lacquer is transferred from the engraved plate to the plush; the lacquer, becoming liquid by the heat of the press, serves to fix the bronze powder to the plush fibres, while the superfluous lacquer passes through the plush and is absorbed by the porous material underneath. A print produced in this manner is very clear and adheres well to the plush.

The Manufacture of Ornamental Waterproof Fabrics.

An invention relating to improvements in the manufacture of single, double, or compound, india-rubber water-proof fabrics has been patented. The first part of the invention consists in taking any desired and suitable woven fabric and "spreading" it with the india-rubber "proofing" and then "curing" or vulcanising it by any of the well-known processes, then passing the fabric so prepared through embossing rollers, engraved with suitable designs, and especially prepared free from sharp edges to prevent the cloth being cut, or we emboss the desired pattern by any other embossing mechanism. The second part consists in the production of double texture embossed india-rubber waterproof fabrics at one operation, by spreading india-rubber cement, or waterproofing, on one or both fabrics, so as to cause both fabrics to adhere to each other when united, and in uniting them by passing them double through the embossing rollers, which will thus emboss and press the two fabrics together, which are then cured or vulcanized. The invention relates, thirdly, to single texture india-rubber waterproof fabrics, and consists in proofing or spreading and polishing, or varnishing, and then embossing, the india-rubber or proofed side of the fabric with designs to produce the required ornamental effects thereon, by embossing mechanism, in which the engraved roller is carefully prepared, by removing all sharp edges, so as to operate upon such thin woven and proofed fabrics as will be suitable for ladies' waterproof garments, and other purposes, without injury to the woven fabric, and finally curing the prepared and embossed fabric. Various and alternative processes are also claimed by the inventors.

Machine for Unrolling and Measuring Textile Fabrics.

Mechanisms for the measuring of textile fabrics have not, hitherto, had as much attention given to them as, in future, they are likely to have, but as the question of short lengths has recently come so prominently before the public, machines for the purpose of unrolling and measuring fabrics are likely to be speedily in great demand. An invention for the purpose has been patented which will answer all ordinary requirements, and a short description of the mechanism may interest our readers. Around three or more loose, (by preference, four,) horizontal rollers, one, or more endless bands are placed, and the roll of cloth, or other material to be unwound, is put thereon between the two upper rollers. The band or bands, which are loose, are pressed down by the weight of the roll, and thereby tightened on the rollers which are arranged parallel with each other, and in such a manner as to allow sufficient space between them for the roll, which depresses the upper surface of the top part of the endless band or bands, without interfering with the free revolution thereof. A drum, with

a horizontal axis, parallel to the axes of the before-mentioned rollers, is arranged above the said band or bands and rollers, and the circumference thereof is covered with cloth, or is otherwise suitably roughened. The drum is rotated by any suitable means, such as a crank handle attached to it, the rotation causing the material, which is passed over the same, to be drawn upward from the roll. In order to effect the measurement of the cloth or other material, the circumference of the drum is ascertained, and suitable gear, with a dial and pointer, or any of the known forms of construction, is arranged at one end of the drum axle for recording the number of revolutions, or the equivalent length of material which has passed over the roller.

The Trade of the World.

[From Special Telegrams and Sources of News all over the World.]

THE CHINESE SILK, COTTON, AND WOOLLEN MARKETS.—A number of Australian merchants are said to be endeavouring to create a market for their wool in China. This is not likely to be a very successful enterprise, seeing that the Chinese dislike woollen cloth and flannel goods. They do not object to weave silk and satin, cotton and flax, or linen cloth, but spinning and weaving wool is not much in their line. So far as it has been introduced at all, it has been in the northern provinces, far away from any seaport or river navigation, and this trade has been introduced because there has been locally an abundance of camel, sheep, and goats' wool. Some of the latter is equal to cashmere, and the natives weave a rude kind of flannel or serge from it. The remainder of the wool is worked up into rugs, felt hats, and a number of other articles, or twisted into ropes; much of it also being allowed to rot for want of market. The only way for outsiders to get into the market would be to set up factories in China itself, for the weaving of cloth, serge, and flannel. Rabbit furs, if properly dressed, could be sold to a large extent. The Chinese are very fond of fur, but the poor are obliged to put up with lamb skins, and the fur of the cat. If good wheat, flour, oatmeal, cracker wheat, and wine, could be put on the market in China, at a reasonable rate, a good deal of business might be done.

HOW TRADE IS DONE IN CHINA.—While on this subject, we may give the substance of an exceedingly interesting foreign report as to the manner in which business is done in China. The writer remarks that Chinese traders, as an almost universal rule, are strictly honest. Business is done in English. Every morning, Chinese brokers present themselves in the European houses of business, bringing with them commissions, and offer either to buy or sell, according as it is a question of importation or of exportation. When the bargain is struck, it is always executed at the fixed time. It is a rare thing for a Chinaman to ask for anybody's signature to a contract, or to give his own. When the orders are numerous, and they belong to different categories, as for instance, silk, in which the goods might possibly be of different sorts, the transaction is recorded in a notebook. The European who failed to fulfil his bargain would be immediately "boycotted" by all the Chinese traders, sometimes for a year and more. This is an instance of that solidity which is one of the not least curious features in the Chinese character—the merchant, who has been thus "boycotted," or placed in what the writer calls "quarantine," cannot buy even a ball of silk, nor sell a piece of cotton. Cases of this kind, however, are exceedingly rare. At the time fixed for delivery, the goods are examined and definitely accepted, if they are in the stipulated condition, or rejected in the other event. The European houses employ special men of great skill and experience for the examination of certain goods, such as tea or silk. Upon articles of smaller value, they generally take the advice of an official known as the *compradore*, who is a Chinaman, and always able to speak English. Before the establishment of European banks, the *compradore* was a personage of considerable importance. Every business house has its *compradore*, who pays and cashes bills for the house which employs him, and who is himself paid according to the importance of his services, his perquisites varying from Ts.1,000 to Ts.4,000. He is obliged to deposit security in a bank, which sometimes amounts to as much as Ts.100,000, and occasionally sureties are also given. Now that European banks are established, the importance of the *compradore* has much diminished. The *compradore* of a bank, however, still preserves the old and profitable importance once universally attached to his post.

TEXTILES.—Our Barcelona correspondent writes to say that the Spanish trade in textiles has recently undergone quite a revolution. A new fashion, said to have come from Paris, and which is becoming general in the Peninsula, is supplanting plain white goods in favour of striped and coloured articles. There are seven large steam spinning and weaving mills in Villaneuva and Gelbru. Out of these seven, only three are now working. Some are said to be undergoing alterations, but whatever the motive may be for suspending operations, the fact is indisputable that more than half of the operatives are out on forced strike.

FANCY GOODS IN JAVA.—An Austro-Hungarian government report from Java, made by a special commissioner sent in the imperial warship *Nautilus* to inquire into matters affecting the commerce of that country, observes that chenille shawls of various sizes and patterns from Moravia are in demand. The prices must be moderate. Flannels, grey and violet, are asked for in the better qualities. Business can also be done in cotton table napkins, cloths, and dress goods. In shirts, the market is

more overstocked. In silks, it is impossible to compete with Switzerland. Half silks of Austrian make produced in good qualities are too expensive for the Java consumer. Colour, finish, and surface are wanting in the Austrian woollen and worsted cloths. Fezzes are imported chiefly from Strakonitz and Hussinee.

The Spring and Summer Seasons of 1888.

Hints for Manufacturers.

The productions of manufacturers of worsteds, woollen, cotton, and mixed fabrics in the United Kingdom, have gradually grown, in excellence in nearly every respect during the past few years. In the diversity of materials, in design, colour, finish, and weaving capabilities, the goods at present being made, as we have before stated, are in marked contrast to those of twenty years ago. Every season, there are fabrics put upon the markets that are a distinct advance in some respects upon those of preceding seasons, and though they may not be absolutely new, still there are features in their composition that make them appear so. In dress fabrics—a manufacture in which there is much scope for novelty—the variety of patterns is endless—from the plain weaves to the most elaborate, in which the jacquard or other mechanism is essential for their production. In recent issues of our Journal, descriptions of some very effective patterns have been given, and have been utilised by some of our subscribers, we propose, therefore, to give a few hints that may be of practical value to manufacturers of dress and mantle cloths. These are culled from good authorities on fashions. In silk goods, for autumn and winter next, speckled designs will be found upon bengalese silk grounds, they are rather expensive materials, as made by French manufacturers, but they may be imitated in woollen clothing stuffs, and will prove very attractive, and may be got up cheaply for dress and mantle cloths. In other descriptions of goods which are now being made on the Continent, many imitations might be made in different materials, the effects being produced in varied colourings. The German manufacturers are paying special attention to the following at present. Fine ribbed cashmeres in grey with terra cotta colour velvet dots, green wool Ottomans patterned by small stars, in dark bronze colour, and blue cashmere *foules* patterned by light blue pastilles of velvet, which all contribute to an excellent collection. Set-off velvet designs appear to be much preferred. They will form a very valuable addition to patterns. Tiny flowers carried out on versi-coloured velvets is a style that has long been known. The new designs are in the style of imitation coins, carried out in velvet with silk reliefs. Tea-green ground colours, with dark-blue velvet patterns, and bluish-grey grounds with sapphire blue velvet, are designs worthy of note. The colour shadings' list for the winter has been further extended by the introduction of some new blues, varying in shade from azure to plum-blue. Blue shadings are in much demand for the winter, but only in those dark colours which do not approach the navy-blue. There are two colours which deserve to meet with a favourable reception, as they are really very elegant and adaptable:—one is *cuirrusse* (Russian leather), and the other beetle gold brown. Both shades answer perfectly to their names. Among other new stuffs may be mentioned bengalines with large velvet points in various shades. *Rayé des députés* is the name of a new stuff in the imitation woollen branches; it shows, on a coloured stripped ground, small contrasting velvet lines divided again by narrow stripes. A new application in stripes is to be noticed in the *rayé villégiature*. The velvet figure patterns already mentioned are in a large selection of designs; one very neat design for the winter being the stuff *petomène* upon which coloured chenille flowers are carried out in broad rows. Some really elegant new *brochés*, amongst which we must draw attention to the *broché de la victoire* show hand-broad stripes relieved by very pleasing floral designs. Also, worthy of mention, is *satin d'Eyffiel* showing silken flower effects between broad satin and fine transparent gauze ribs.

A meeting of the committee to promote the use of better patterns for Irish laces has been held at the offices of the Department of Science and Art, London, S.W. The committee approved a scheme for the third annual competition for prizes amounting to £48 5s. offered to designers of patterns, the particulars of which will shortly be announced.

Wrong Marking of Piece Goods.

We give a copy of the reply from the Bengal Chamber of Commerce, Calcutta, to the memorial of Manchester merchants on the subject of wrong stamping of piece goods.—The committee of this chamber have considered the representation, dated the 18th November, of the Manchester firms engaged in the Indian trade, and direct me to reply as follows:—The representation suggests that this chamber and the mercantile community of this city should move the Legislature of India to pass an Act similar to Act 25 and 26 Vic., chap. 88, secs 7, 8, and 13, with a view to effectually suppressing the evil of marking goods for India in a way that is calculated to deceive buyers as to the true lengths of pieces. I am to point out that this chamber has succeeded in securing the adhesion of the Chambers of Commerce at Bombay, Madras, Rangoon, and Kurrachee to a movement having for its object the legislative sanction of the British imperial yard of 36in. as the standard of length for British India, and the Indian Chambers have now memorialised the Government of India in this sense, and the matter has been referred to the various administrations and departments for opinion, with a view to some action being taken. Meantime, the committee understand that cap. 88, secs. 7, 8, and 13, 25 and 26 Vic., though covering the evil of which complaint has been made, is practically inoperative in England. The possibility of this being urged in reply to any such recommendation as that suggested in the representation of the 18th November will not have escaped your attention and that of your co-signatories to that document. Much can be done in England to deal with the evil in the direction of making the English Act, or an amended Act, workable. In India, the position appears to be that the only provision of the Indian penal code, under which any person can be punished for putting incorrect marks as to lengths on piece goods or otherwise, is that directed against cheating. The definition of cheating, though wide, requires an intention to deceive, and to cause a person to do something which otherwise he would not have done. The committee of this chamber are of opinion that it would be very difficult to obtain a conviction for cheating in the case of piece goods bearing a wrong or incorrect stamp of lengths, as it would be necessary to prove affirmatively that a person selling piece goods incorrectly stamped, and so incorrectly stamped in England, knew that the goods measured, in fact, less than the lengths indicated by the stamp. Only upon such proof being given could the seller be said to have deceived the purchaser fraudulently or dishonestly. It must be apparent that it would be next to impossible to procure this proof in the case of goods in long lengths, folded, and which arrive in bales or cases, and the opening of a piece of which, for the purpose of measuring it would be to depreciate it in the market. The difficulty which here presents itself would not be got over by the passing of such an Act similar to cap. 88, 25 and 26 Vic., although the passing of such an Act might help in the direction of putting down the practice of wrongly marking cotton goods, for the proof of knowledge on the part of the seller would still be necessary, and in the majority of cases would be impossible to give. In order to suppress the practice of selling piece goods marked with incorrect lengths, special legislation would be required, making it an offence for any person to sell goods so stamped unless inquiry should have ascertained that the length was incorrectly stamped. Further, as India has no legal standard of length, it would be necessary that any Act which might be passed with this object should contain a provision that the word "yard" should, in all cases, be taken to mean the English standard yard of 36 inches measured in a prescribed way. Again, the legislature might reach its purpose more directly by a measure of law, making it illegal to import into India goods incorrectly marked as to their lengths, and making such goods liable to confiscation. But the committee of this chamber are of opinion there would be very great difficulties in the way of the Indian Legislatures passing such Acts. Practically, however, the legal sanction of the English standard yard of 36 inches as the standard of length for British India will go a very great way towards stopping the importation of short length piece goods. Holding this view, the committee consider that it would be advisable to await a reply from Government to the representations already submitted, before moving further in the matter.

The Merchandise (Fraudulent Marks) Bill.

The Merchandise (Fraudulent Marks) Bills introduced by Mr. Mundella, to amend and consolidate the law relating to the fraudulent marking of merchandise, is meant to afford additional protection against the pirating of trade marks, repealing in various respects the Act of 1862. The second clause of the Bill provides that every person who forges a trade mark, or makes any die, block, or other instrument for the purpose of forging, or is improperly in possession of any forged marks or instrument for forging marks, "shall be liable, on summary conviction, to imprisonment, with or without hard labour, for a term not exceeding four months, or a fine not exceeding £20." At the same time, he shall be liable to forfeit all goods and things in his possession in relation to which an offence under the section has been committed. A person will be deemed to forge a trade mark who makes the same, "or any mark so nearly resembling the same, as to be calculated to deceive," unless he prove assent on the part of the proprietor. In the next clause,

every person who wrongfully applies a trade mark, or a colourable imitation of a trade mark, to any goods is liable to imprisonment with, or without, hard labour, for a term not exceeding four months, or to a fine of £20, and also to the forfeiting of the goods concerned. Among the paragraphs relating to the wrongful application of a trade mark is one which deals with the person who "uses a trade mark, or a mark resembling a trade mark, in any manner calculated to lead to the belief that the goods, in connexion with which such trade mark or mark is used, are designated by such trade mark." Where assent is alleged, the burden of proof falls on the defendant. The fourth clause of the Bill deals with the important matter of false trade descriptions, the punishment being the same as that for wrong application of marks. A false trade description means any false description, statement, or other indication applied to goods:—(a) As to the number, quantity, measure, or weight of such goods. (b) As to the place or country in which such goods were made or produced. (c) As to the mode of manufacturing or producing such goods, or as to the material of which they are composed; or, (d) As to such goods being the subject of any existing patent, copyright, or privilege. It is not an offence to apply to any goods any name or expression generally used for indicating such goods to be of a particular class or description of manufacture only. In the case of selling goods with false trade marks, or trade descriptions, the penalty is a month's imprisonment or a fine of £10, but, on proof of reasonable precautions having been used, innocence is established, and there is no liability. Provision is made in the Bill for the defendant to give evidence. In a case where a constable is obstructed in his search of any place, the offender is made liable, on conviction, to the same punishment as if he had been guilty of having in his possession goods or things liable to forfeiture under the Act. Among the "savings" of the Bill is a clause which runs:—"This Act shall not exempt any person from any action, suit, or other proceeding which might, but for the provisions of this Act, be brought against him."



ODDS AND ENDS.



It has been decided to extend the transit accommodation in India, by the construction of the "Bengal-Nagpore" railway.

* * * *

Moscow is said to be agitated by the fear that British goods may flood her markets in Central Asia, and is demanding a new Customs' line along the frontier. The reason for the panic is the rumour that the British Government was about to construct a railway through Afghanistan.

* * * *

At a meeting of the British colony held in Constantinople on the 9th, ultimo, it was resolved to establish a British Chamber of Commerce for the protection and furtherance of the interests of British trade, finance and shipping in connection with Turkey and of British traders engaged in operations with Turkey.

* * * *

The duties on goods imported at Monte Video, South America, or any other part of the Oriental Republic of Uruguay, are now charged on the gross weight, so that if the cases in which the articles are packed are heavy, the import duty is greatly increased; it would be well that merchants, consigning goods to this place, should not use packing cases of greater weight than necessary for the security and conveyance of the contents.

* * * *

The *Consular Zeitung* states that the Export Association for the Kingdom of Saxony has opened a sample exhibition at Amsterdam. Up to the present, about 100 members of all the different branches of industry have notified their participation, and many more are promised. The Commercial Museum, created by the Chamber of Commerce at Frankfurt-on-Main, has been opened to the public.

* * * *

Baillard, of Rouen, has patented a discovery which, if actually what it is stated to be, will have far reaching consequences. It is for converting non-saponifiable oils into saponifiable oils, and so admitting the whole class of mineral oils to all the uses of fat oils. The change is effected by oxidation. The patentee claims that his discovery is based on the fact that oleic acid possesses in a high degree the property of transferring to mineral oils a portion of its oxygen; the same property resides in acrylic acid and acroleic acid and animal or vegetable fats in a rancid state. In the complete specification, the use of chlorine as an oxidizing agent is mentioned along with basic oxides. Mineral oils treated as described are said to be perfectly applicable for use in the woollen manufacture, and by the addition "of from two to ten per cent., by weight, of fixed vegetable oils, such as cotton, castor, etc., are being employed as mordants in dyeing fabrics composed of vegetable fibres."



Receiving Orders.

Walton, S. (trading as A. S. Walton), formerly 6, Booth Street, now Hanging Ditch, both in Manchester, spinner and manufacturer, Manchester Court.

Adjudications of Bankruptcy.

Statham, J. (trading as Thorp and Statham), Dowley Gap, near Bingley, Yorkshire, stuff finisher.

Dividends.

Cudworth, W., and Cudworth, J. R. (trading as William Cudworth and Son), Highfield Mills, Ossett, Yorkshire, worsted spinners, 0 3.16d. (final), Official Receiver's Offices, Bank Chambers, Batley.
Knowles, A., Bradford Road, Batley, Yorkshire, wool merchant, 10 2d. (final), Official Receiver's Offices, Bank Chambers, Batley.
Mann, H. H., Bradford Road, Dewsbury, Yorkshire, wool and waste merchant, 2 1/2d. (final), Official Receiver's Offices, Bank Chambers, Batley.
Leadbeater, J. (trading as Leadbeater and Co.), Gillroy Mill, Morley, Yorkshire, woollen manufacturer, 2s. (first), Official Receiver's Office, Bank Chambers, Batley.
Robinson, T., 3, Quebec Street, Leeds, Yorkshire, woollen cloth manufacturer, 7s., Jas. Smith, Barnfather, F.C.A., Victoria Square, Leeds.
Sackville, J. W., formerly Castle Terrace, Sedley, now 133, Church Street, Pendleton, both in Salford, Lancashire, calico printer, 20s. (with interest at the rate of £4 per cent. per annum from the date of the receiving order, (first and final), Official Receiver's Offices, Ogden's Chambers, Bridge Street, Manchester.

Dissolutions of Partnership.

Bancroft, W., and Bancroft, W. H., Well Lane, Halifax, worsted manufacturers.
Dickinson, B., and Dickinson, B., jun., Aspley Mill, Huddersfield, cloth finishers and dyers.
Eccles, W., and Ramsbottom, W., Hazlehurst Mill, Mill Street, Hazlehurst, Ramsbottom, Lancashire, towel manufacturers.
Hustler, B., and Dawson, Elizabeth, Albert Mills, Morley, Yorkshire, cloth finishers.
Simpson, J., and Moorhouse, T., Argyll Street, Burnley, Lancashire, cotton manufacturer.

PATENTS.

Applications for Letters Patent.

Applying chenille, &c., to tulle, &c. H. H. Lake, London.	4th Feb.	1,810
Automatic stop motion and doffing indicator for spinning and twisting. J. Hollisworth, Bradford.	11th Feb.	2,163
Apparatus for cleansing, bleaching, burling, scalding, and dyeing spun textiles. J. A. Berly, London.	23rd Feb.	2,814
Auxiliary picking strap for looms. J. Sowden, Bradford.	24th Feb.	2,875
Belts or bands for driving machinery. M. Gandy, Liverpool.	2nd Feb.	1,658
Belts or bands for driving machinery. M. Gandy, Liverpool.	3rd Feb.	1,727
Bleaching vegetable tissues. A. J. Boulton, London.	4th Feb.	1,816
Belting. F. T. K. Firmin, Liverpool.	11th Feb.	2,143
Bleaching. A. J. Boulton, London.	15th Feb.	2,354
Bead ornamentation of lace, &c., and appliances for fixing the beads. W. C. L. Unwin, London.	18th Feb.	2,557
Cutting velvets, cords, and similar piled fabrics. G. Roger, Manchester.	28th Jan.	1,350
Carding engines. J. Elce and T. S. Whitworth, Manchester.	29th Jan.	1,427
Crabbing or boiling and steaming fabrics. E. Kemp, Leeds.	1st Feb.	1,617
Coating pullies, belting, or other devices operated by friction of surface. T. H. Wright, London.	2nd Feb.	1,680
Circular looms. A. De Laski, Boston, Mass.	5th Feb.	1,879
Compound for producing designs on textiles. H. H. Lake, London.	10th Feb.	2,123
Cutting pile of velvets, &c. D. Scott, Manchester.	12th Feb.	2,206
Cutting velvets, &c. D. Scott, Manchester.	12th Feb.	2,207
Cutting velvets, &c. G. Roger, Manchester.	12th Feb.	2,208
Carding engines. T. B. Kay, Manchester.	12th Feb.	2,215
Compound ordinary friction weighting motion for regulating the tension on the warp beam, a loose reed motion, and an improved spring buffer or check for preserving the picking stick, picking strap or band, and picker in looms. T. Singleton, Halifax.	12th Feb.	2,243

Connecting harness to jacquards or dobbies. P. Edelston, Manchester.	16th Feb.	2,394
Cards, laths or lags for dobbies or shedding motions in looms. W. H. Tetley, Bingley.	17th Feb.	2,465
Dabbing brushes for combing machines and mechanism therefor. W. H. Cockcroft and S. Best, Bradford.	1st Feb.	1,540
Driving belts. Bockmühl and Karthaus, Manchester.	4th Feb.	1,760
Dobbies. C. Catlow, Halifax.	19th Feb.	2,585
Electro-plating rollers for calico-printing, &c. G. Fremantle, Manchester.	4th Feb.	1,775
Fly frames in card rooms. A. Perry, Ashton-under-Lyne.	28th Jan.	1,340
Flyers for spindles. T. K. Hattersley, London.	28th Jan.	1,385
Flax thread conical conductor. A. McCullough and W. Hanley, Belfast.	7th Feb.	1,894
Finishing Italian or sateen cloths. M. Sharp, Bradford.	10th Feb.	2,081
Friction clutch pullies. W. Mather, London.	12th Feb.	2,247
Friction clutches. W. R. Comings, London.	15th Feb.	2,361
Friction clutches. W. R. Comings, London.	15th Feb.	2,362
Grinding and adjusting carding engine cylinders and flats. J. Bullough, Accrington.	1st Feb.	1,526
Imitation Turkey carpets and tapestry. E. Edwards, London.	23rd Feb.	2,818
Improvements in "self-contained" spindles for spinning, twisting and winding fibres. S. H. Brooks and T. and F. G. Goodbehere, London.	24th Feb.	2,867
Italian or sateen cloths. J. Benn, Bradford.	31st Jan.	1,468
Kidderminster, Scotch or ingrain carpets. T. F. Naylor, Manchester.	29th Jan.	1,422
Looms. E. Brook, London.	28th Jan.	1,375
Lace machines. A. M. Clark, London.	1st Feb.	1,625
Looms. E. Woodhouse and J. J. Grimshaw, Bradford.	10th Feb.	2,091
Lubricators. J. G. Tongue, London.	15th Feb.	2,384
Lubricators for engines. W. Grimes, Manchester.	22nd Feb.	2,713
Lubricating devices or "Telelaine." A. J. Boulton, London.	22nd Feb.	2,751
Mats and hearth-rugs. G. H. Seddon, Huddersfield.	1st Feb.	1,556
New cotton fabric. A. Fiquet, London.	31st Jan.	1,505
New kind of textile. F. H. and A. N. Ford, and J. A. Archer, London.	12th Feb.	2,257
Preparing wool, &c., for spinning. J. W. Smith, Bradford.	2nd Feb.	2,039
Preventing unequal wear of drawing off leathers of combining machines. A. W. Drabble, Bradford.	18th Feb.	2,539
Pulleys or drums. A. House Manchester.	24th Feb.	2,854
Ring and traveller apparatus. W. H. Bramall, J. Wolstenholme, and W. Napier, Manchester.	29th Jan.	1,437
Removing the burr in wool. T. Speight, Bradford.	2nd Feb.	1,648
Rollers and pullies. A. Steel, Sheffield.	4th Feb.	1,768
Rollers used in washing, soaping, dyeing, &c., machines. W. Birch, Manchester.	5th Feb.	1,833
Rollers for printing and embossing fabrics. E. Carter, Halifax.	8th Feb.	1,939
Reversing the action of machinery in motion. J. Winder, Leeds.	16th Feb.	2,397
Regulating tension of warps. T. H. Brigg, Otley.	19th Feb.	2,576
Reeling and winding. W. Noton, Oldham.	21st Feb.	2,647
Sheaves or pulleys. J. Aitken, Liverpool.	28th Jan.	1,394
Sizing machinery. J. S. and J. S. Sutcliffe, Manchester.	2nd Feb.	1,640
Scutching flax, &c. A. M. Clark, London.	7th Feb.	1,915
Spindles and bolsters for spinning machines. H. H. Lake, London.	15th Feb.	2,376
Spinning. B. A. Dobson, Manchester.	19th Feb.	2,577
Taking-up catch mechanism for looms. H. A. Ainsworth, W. Campy, and J. Anderton, London.	31st Jan.	1,518
Treating rhea bark, China grass, &c., and apparatus. G. I. J. Wills and S. L. Howard, Liverpool.	16th Feb.	2,423
Textile threads from viscous or pasty matter. A. M. Clark, London.	21st Feb.	2,694
Twist lace fabrics. A. and F. H. Lees, London.	24th Feb.	2,868
Unwinding or unrolling of the warp or chain in looms. E. F. Brule, London.	22nd Feb.	2,777
Velvets and similar cut pile fabrics. J. W. Hall and E. Lord, Manchester.	24th Feb.	2,846
Weft fork and heald operating mechanism. R. L. Hattersley and J. Hull, Keighley.	9th Feb.	2,018
Warping machines. W. G. Bywater and T. B. Beanland, Leeds.	11th Feb.	2,146
Working fly combs or doffers of carding engines. G. and J. Carver, Cleckheaton.	12th Feb.	2,213
Woven fabrics on lace machines. E. Daveniere, London.	22nd Feb.	2,771

Patents Sealed.

257	874	971	982	1,005	13,453	640	1,041
1,299	14,448	1,256	1,300	1,324	1,361	1,843	2,695
2,699	7,926	12,627	211	6,439	9,985	14,135	1,619
1,622	1,750	1,758	2,667	12,325	14,340	13,625	1,383
1,561	3,209	7,800	1,096	1,981	2,091	14,068	14,571
2,038	2,211	2,215	2,271	2,294	7,980	14,775	

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Notices.

The Yearly Subscription—payable in advance—including home postage, is 10s. Cheques and Post Office-Orders to be made payable to H. & R. T. LORD, 10, Ann Place, Little Horton Lane, Bradford, Yorkshire.

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Technical Education.



RESIDING at the distribution of awards to the students of the Polytechnic Science, Art, Technical, and Commercial Classes, London, the Marquess of Hartington, in speaking of the need for further endeavours to be made to push technical education, said "voluntary effort could not be expected to supply all that was needed, nor could the State either. The state did help, to a very considerable

extent, in science and art instruction, but it might certainly do more in technical instruction. The best method for the State to adopt was to assist local effort, and also to direct the organization which was required. Even then, voluntary effort could not do the rest. Municipal institutions must come forward, and initiate local endeavour. It was to be hoped that the time was not far distant when either the town councils or local governing boards would establish, in every considerable centre, industrial and technical schools suitable to the wants of their respective districts, and supported out of the local funds. Whatever might be the future of this important question, institutions like that of the Polytechnic had done, and were doing, a very great and a very useful work. They were playing the same part in relation to technical and trade education that had been played by the voluntary schools in regard to elementary education. They were showing what could be done, and that there was a demand for education and instruction of that character. The eagerness with which thousands of the young artisans in London were coming forward to avail themselves of technical education was a noteworthy fact. It proved that there was a demand which required to be supplied. A deputation of members of Parlia-

ment and others waited on the Lord President of the Education Council (Lord Cranbrook) to urge the necessity of Government taking action with regard to technical and commercial education. The deputation was introduced by Mr. Mundella, who stated that the education which is given to children by school boards and local authorities is rigidly confined to elementary subjects. Anything in the way of manual instruction or industrial education was ruled out in a way that was very disheartening to those who felt the great need of taking the first step in that direction; and every report he had seen from the city guilds and local authorities was to the effect that the scholars got so little preparation when they came to deal with technical instruction, were so imperfectly taught in drawing, and had so little knowledge of elementary science, so little manual instruction, that much of the time was wasted, when they went to technical or science schools, on account of this deficiency. A Royal Commission on Technical Education, of which Sir B. Samuelson was the head and Sir H. Roscoe the right arm, had sat for three years, and had done their work entirely at their own expense, travelling through Europe and America, and exhausting the whole question, and its recommendations were most urgent on this point. There had also been the more recent Royal Commission over which the lamented Lord Iddesleigh presided, and this commission had prominently put forward the absolute need for technical instruction. Mr. Mundella, having quoted from the work of Dr. Conrad concerning the Prussian system of technical instruction, said the opinion of Dr. Conrad virtually summed up the recommendations of the report of the Royal Commission on Education that, while the Englishman had more force and "go" than any other workman in Europe, he was at present asked to fight the industrial battle badly equipped, and with inferior weapons. The deputation asked, said Mr. Mundella, that the Lord President would give to school boards and local authorities increased powers to promote industrial, scientific, and technical training, and that he would put this department of work, as Professor Huxley had suggested, in an admirable letter to the *Times*, under the Science and Art Department, allowing the Science and Art Department to arrange a curriculum adapted to this extra teaching. In England, we thought a good deal about expenditure on education, but the deputation were not asking for much. Having called attention to the enormous sums spent upon different branches of education, in Old Prussia, Mr. Mundella said that in this country we confined ourselves strictly to the barest elementary education, there being no link between our middle-class schools and our elementary schools, while, owing to the very low standard of elementary education, more than 500,000 children left school every year. Where were they to go in order to gain further instruction to carry on their business? Our night schools were almost extinct, because they no longer fulfilled the purpose for which they were originally intended. A very different state of things prevailed in Germany. At one school he visited in Berlin, he found 2,000 girls had passed through technical studies in the three previous years, having received instruction in drawing, book-keeping, French, English, and even ironing and starching; indeed, everything likely to make them good citizens and good wage-earners in future years. The deputation urged his lordship to signalise his tenure of office by taking one more step in the direction of better education. They asked him to put the English people upon a footing at least as good as that of the Scotch people, and to take a step which would be in the interest, not only of the intelligence of our people, but in that of national industry, and which would do something to save the people from the unthrift and inutility which at present characterised too many of their lives.—Professor Stuart suggested that unless more attention is paid to technical education in this country "they would have to look forward to the common people becoming hewers of wood and drawers of water, to the better educated artisans of other nations."—In response to the deputation, Lord Cranbrook said when he reflected that his right hon. friends, Mr. Mundella and Sir Lyon Playfair, had been at the Education Office for a very considerable time without having accomplished the great feat which they expected him to perform, they would be able to see that this matter was not one of sailing in smooth waters. He was, however, quite at one with the deputation in thinking that one of the great wants of this country was that adequate technical instruction should somehow or other be got. There were two

classes of technical instruction, the one what might be called elementary, and the other secondary. It was to the latter part that most of the previous speakers had addressed themselves. It was perfectly clear that whatever had to be done must be done by way of legislation. It was perfectly clear, in the second place, that whatever was done must cost somebody something. He could see no objection, in itself, to localities rating themselves for the purpose of establishing a system of technical education, which would be particularly suited to the several localities. He saw no objection, in the second place, to any science and art training to a certain extent. With regard to the connection between school boards and local authorities, he should not like to pronounce without consulting his colleagues. Therefore, his personal opinion would not be worth stating, but, when he spoke of local authorities, he meant that some authority in the locality should be able to find the means of some good industrial training, beginning at the point of which Mr. Howell had spoken, and going up to that real secondary education, which could never be reached by the Elementary Department over which he had control. Sir Bernhard Samuelson well knew that it was not only with the large towns that they had to deal, but also with the population in villages. In many of these places, the object would be to prepare children for the ordinary work of skilled agricultural labourers. Lord Cranbrook said that, with regard to the grants for drawing, which was the foundation of the whole of the elementary portion of technical education, they were unfortunate at present as there had been some falling off, which, he hoped, would cease. With reference to night schools, he thought they should be more taken advantage of. The former uses of such schools had now passed away, there would soon be, comparatively speaking, few young men who had not a good elementary education, and therefore night schools might be utilized for other purposes than elementary education, they might be used as schools for cooking classes for girls and for some kind of industrial training for boys, who had no other means of obtaining it. He admitted the force of the argument that not only were the poorest classes in some respects better off in the way of industrial training than those above them, but also that the criminal classes had some advantage in this respect. He had expressed himself freely, but he was anxious to meet the deputation as far as he could by advising with others and endeavouring to obtain the means of empowering local authorities as far as possible to deal with this question. But how far the country or Parliament would be disposed to extend to the Education Department anything beyond that means of dealing with elementary education which it now possessed, it was not for him to say. Certain kinds of manual labour might very well be applied to elementary education; but for children who left school at 11 or 12, it was hopeless to suppose that much could be done. Still, he thought, they might be enabled to offer advantages which could keep even these children a little longer at school; but with regard to his pronouncing an opinion further than he had done, as it was a subject for legislation, he was sure they would forgive him doing so.

Lincolnshire Jubilee Exhibition.

The citizens of Lincoln have determined to celebrate the jubilee year by the opening of an exhibition on a large scale. It is to consist of five sections, namely, fine arts, embroidery and needlework, industrial, historical and scientific, and it is to be held in the new School of Art and Science, a building admirably adapted for the purpose, and large enough to hold a thoroughly representative collection. The proceeds are expected to be large enough to cover the expenses of the undertaking, and also to defray the debt incurred in supplying the above schools with furniture and scientific apparatus, and should there be an overplus after meeting these liabilities, it will be devoted towards providing Lincoln with a permanent art gallery. The industrial section will include specimens of Lincolnshire natural productions, as well as models and mechanical designs. With the view of stimulating the inventive faculties of the artisans, the committee have offered substantial prizes for the best models or designs prepared during the present year, and this is a feature which is sure to add to the interest of the collection. The scientific section embraces specimens of the natural history and geology of the county, as well as inventions, electrical apparatus, and the like.

How the Navajo Indians Weave.



THE art of weaving is undoubtedly of high antiquity among the American aborigines, and was brought to great perfection long before the advent of the white man. The reasons for thus believing cannot be discussed in the limited space here allotted. Probably in no tribe on the continent at the present time are higher results in weaving obtained, or ruder means employed, than among the Navajo Indians of New Mexico and Arizona, and among none, perhaps, has the craft of the weaver been less Europeanized. Hence, a brief description of their processes and appliances cannot fail to interest the student of this art. In preparing their wool, the Navajos now use the hand card, purchased from the Americans. Previous to the introduction of this tool, a tedious method of picking with the fingers and rolling between the palm was employed. They still spin their wool with the old distaff, consisting of a simple rod of wood thrust through a hole in the centre of a round disc, although their Mexican neighbours on the Rio Grande, with whom they have had constant intercourse in peace and in war for the past three hundred years, use the spinning wheel. And, although they probably possess sufficient ingenuity to make wheels, and undoubtedly have ample means to purchase them, they have never adopted them. They cling to the older and simpler implement. Their most important native dyes are the following:—A dull, brownish-red (approximating the tint of burnt sienna), a deep black, and a brilliant yellow. The red dye is a decoction of the bark of alder mixed with the bark of the root of mountain mahogany (*Ceroco carpus*). The yellow is a decoction of the flowers of a species of *Senecio*, with a crude native alum (*almogen*) for the mordant. The black dye is made by throwing into a strong decoction of the twigs of aromatic sumac (*Rhus diversiloba*) a calcined mixture of pinon gum with a mineral substance called by the Navajos *tse kon*. Besides these colours, they had, in old times, as they have to-day, wool of three different natural tints, viz.,—the white of the ordinary sheep, the rusty brown of the so-called black sheep, and the grey wool of the grey sheep. So, before the introduction of new colours by the whites, they had a fair range of tints wherewith to execute their artistic designs. In time, the Mexicans gave them indigo, and as far as is observed, this is the only dye which the Spanish Americans introduced. With this, by varying the strength of the solution, they colour their wool of different shades of blue, and, by adding their native yellow, they make different shades of green. But the Mexicans brought them another material, which has added even more than indigo to the beauty of their fabrics. This is the bright scarlet cloth known as *bayeta*. The face of this cloth has a long nap; the Indians ravel it and use the weft. Originally brought from the south by the traders from Old Mexico, it is now procured from the wholesale dealers of our Atlantic seaboard by the Anglo-American traders. It is much superior in finish to the scarlet strouding supplied to the Indian trade of the North, and although it comes labelled with an illuminated Spanish coat of arms and the legend in Spanish, "*Bayeta de cien hilos grana*," it is probable that it is now made in England, if not in the United States. Of the materials and colours above enumerated, some of their most beautiful blankets are still made. But, of late years, the Yankee traders have brought much American yarn into the country, and the finer serapes are now largely made of Germantown wool. This is most likely to be the case in blankets made to order for Americans, since the party giving the order is usually required to supply the yarn. American traders have, strange to say, introduced no new dyes among them; but it is believed that a series of aniline dyes would be extensively purchased by the Navajos, if they were once taught the use of them. To make an ordinary blanket, the weaver usually proceeds in this way:—She selects two slender straight trees, about 6 or 8 feet apart, or erects two posts about the same distance from one another. To these she lashes two horizontal parallel poles—one close to the ground, the other at a height of 6 or 8 feet, according to the size of the blanket to be made. This arrangement serves as the frame to which the loom is secured. Thus it is evident that the web must hang vertically before the weaver. Two stout, round sticks, each about an inch and a half in diameter, form the beams of the loom. The upper stick may be called the yarn beam, and the lower one the cloth beam, from their counterparts in the European loom; but they differ from the latter in that they do not revolve. The warp is never wound around the one, nor is the finished web ever wound around the other, hence the Navajo cannot weave a piece of indefinite length. The yarn beam is secured with cords to the upper transverse pole of the frame, so as to hang horizontally, and the cloth beam is tied to the lower pole; the distance between the beams being the length of the proposed blanket. The application of the warp is the next thing in order. An extra stout woollen cord is laid along each beam parallel to its axis, on the upper side of the lower beam, and on the lower side of the upper beam. These cords are secured in position by means of a spiral thread. The warp is then fastened to these stout cords, and when the blanket is finished, they are found included in it, forming the borders at the ends. When this is done, the healds are applied by looping one continuous string in figure 8 loops, twisted once in the middle, one of the circles of each figure 8 including the selected thread of the warp, and the other passing around the rod. In ordinary weaving, only one set of healds is used. The place of the other is supplied by putting a stout rod into the shed. When the weaver wishes to pull the healds forward, she pushes this stout rod up out of the way, and draws the rod which holds the healds towards her. For the next cast of the shuttle, she draws the stout rod downward, and so throws the warp in the heald backward. The word "shuttle" is used only for convenience of description. Properly speaking, the Navajo woman has no shuttle. If the pattern is a simple one, where a single thread of the weft is passed the whole way through the shed, the yarn is wound on a rough stick or slat; but if the pattern is intricate, where each thread of the weft is reversed every inch or two, the yarn is simply made into a small skein and shoved through the shed with the finger. Their substitute for the reed is a small wooden fork, having about five or six tines. With this, the weft is made to

lie smoothly; but, in beating it firmly into place, another instrument is used, which is called the batten. The batten is a broad, thin oaken stick; it is inserted lengthwise into the shed, and applied to the weft with firm blows. It is by the vigorous use of this tool that the Navajo blanket is rendered waterproof. The weaver sits on the ground, and works from below upward. When the web has been completed to the height of about two or three feet, the cords which fasten the yarn beam are somewhat loosed or lengthened, the beam is lowered, the finished portion of the web is folded and sewed with coarse stitches down to the cloth beam, and the unfilled warp is thus brought within convenient reach of the artisan. This arrangement supplies the place of the revolution of the beams in our looms. A new Indian blanket is rarely seen, except one of the smallest size, in which the marks of these stitches are not visible. Many blankets, particularly those used for saddle blankets and women's dresses, are made in the style of our tweeds and diagonals. In some specimens, the diagonal ridges are seen to run continuously in one direction, while in others, the direction is varied, so as to make diamond or zigzag figures. These effects are produced by using three sets of healds, which are applied to the warp and actuated on essentially the same mechanical principle as those employed by our own weavers in making similar fabrics. In goods of this description, the Indians do not attempt such elaborate designs in colour, as they do with goods woven with a single set of healds. Usually, diagonals are seen in one solid colour, or in plain stripes; but they are more extensively manufactured by the Pueblo Indians than by the Navajos. The Navajo blankets, notwithstanding their weight and thickness, are all single ply, and, consequently, the figures are the same on both sides, no matter how intricate they may be. The Indians do not understand our method of producing figures by completely hiding one set of threads with another set; but neither, it would seem, are our weavers capable of making single-ply patterns like those of the Indians. Of all the imitations seen, only those of the plain striped patterns are even tolerably successful; where the more intricate patterns are attempted, it always results in failure. It must be remembered that the Navajo woman has a separate shuttle or skein for every element of her pattern—to see a dozen different little skeins hanging from the front of a growing web, is a common sight—and that the shuttle is not thrown the whole width of the web in every case, but only the width of the particular figure to be represented. A similar result, it seems, could only be produced cheaply on our looms by using a single warp thread, dyed of different colours, the length of each coloured section being carefully computed, so that, when woven, it would make a definite pattern. But even if this arrangement were possible, many blankets of the same pattern would have to be woven in order to "make it pay." How, then, would such blankets compare with those of native make? Of many hundreds of the finer Navajo blankets examined since in New Mexico, there were not two of exactly the same pattern. Every owner of a genuine blanket of this kind may feel reasonably certain that he possesses an article which has not a duplicate in the whole world. Expensive as these blankets are, the weavers are but poorly paid for their trouble. From three to six weeks are commonly spent in making one of the best serapes. They do not weave them for sale; there is too little profit in making them, and the Navajos are too wealthy to seek income from such a course. The women weave them partly for artistic recreation—just as our ladies embroider—and partly for the sake of personal adornment. It is only when they get tired of a blanket and want a new one, or meet with heavy losses at monte, that they sell it. Hence new blankets of the best workmanship can rarely be obtained except at exorbitant prices. Blankets are, however, not the only "fruit" of the Navajo looms. Handsome sashes, garters, bands for the hair, and saddle girths, are also woven; the apparatus for making which naturally differs in size from that used in weaving the blankets. They also knit stockings and slippers with four needles.

The Manufacture of Turkish Carpets.

An Italian writer, resident in Smyrna, sends home the following report respecting the manufacture of Turkish carpets at Jordes, Asia Minor. Jordes is a village of 1,000 houses, and 6,000 inhabitants, in the interior of Asia Minor. It is reached by rail from Smyrna as far as Saliki, and thence by horses in 11 or 12 hours. The population is almost entirely Turkish. This village is famous as being one of the centres of the so-called "Smyrna Carpet Manufactory." This industry, in which Anatolia competes successfully with Persia, is established in four points, viz.:—First, the products of Usciak which are the best and by far the most extensive; secondly, those of Jordes; thirdly, those of Kula; and fourthly, those of the Juruk, or nomad Turcomans of the interior. The carpet manufacture of Jordes is carried on exclusively by Turkish women, with the exception of the dyeing, which is entrusted to the men. The country supplies excellent wools at 5.05 quarter piastres in Jordes. The wool is dyed by about ten dyers, for from five to seven piastres per oka, and there is also a public dyeing establishment in the bazaar. Some of the dyes, such as indigo, cochineal, as well as certain acids, come from Europe. Vallonia, madder, &c., are produced in the country. Amongst the colours should be noticed the Gordes mavisi, or blue of Jordes, the ancient natural blue, and the Griffith sarisi, Griffith yellow, so called because recently introduced in the manufacture of Turkish carpets by the firm of Messrs. Griffiths in Smyrna. The carpet manufacture of Jordes

is very ancient, but it is only during the last 40 years that it has extended itself so much. The Smyrna merchants give the design the dimensions and colour according to the requirements of the European and American markets. Hence it is that in a village which in 1885 produced carpets to the value of £T25,000 and £T28,000, not a carpet could be bought, as the manufacture depends entirely upon actual orders. Jordes carpets are manufactured for the firm of Messrs. P. d'Andria and Co. (Italian), W. Griffith and Co. (English), and Hebissee, Pollaco and Co. (Turkish), all in Smyrna. The firm of Andria and Co. employs from 200 to 1,000 female workers at Kula, and 3,000 at Usciak. There are at present in Jordes from 250 to 300 looms, all made in the country, and of the most primitive description. Messrs. Andria and Co. have a large factory at Usciak, where 500 Turkish women work at machines for carding, dyeing, and performing other preliminary operations upon the wool. The looms are of various dimensions. At Jordes, the largest are six metres long, but at Usciak, there are some 10 and even 12 metres long. The height is usually two metres. The Government favours the manufacture, there being no tax upon the looms. The municipality exercises a strict superintendence over the dyes and dyeing establishments, so that the manufacture may not be discredited by the use of inferior dyes. At Kula and Usciak, the carpets are of pure wool, whereas at Jordes, the wool is of cotton. The work is tedious. Jordes carpets are of different qualities, the commonest of which costs, in Jordes itself, from 37 to 38 piastres per square piece, the second quality from 40 to 43 piastres, and the best quality 50 piastres and more. Before reaching Smyrna, the carpet is subject to an increase in the price, viz.,—5 per cent. commission to the agent, 2 per cent. expenses of transport by horse and rail, from $\frac{1}{2}$ to 1 per cent. postal expenses. From Jordes to Saliki the carpets are carried on horseback and cost 35 piastres per bale of from 80 to 90 kilos. The Usciak carpets are transported on camels as far as Alasceio in bales of 150 kilos, and the carriage costs 15 paras per oka. Most of the orders for Jordes carpets now come from America, but few coming from England and France, and none at all from Italy. The manufacture at present is very flourishing, and it is supposed to increase by 15 per cent. every year.

Hours of Labour in Germany.

Bills on this matter have more than once been laid before the Reichstag; hitherto, however, without any tangible results. But the bill now standing before Herr Hitze's name will, in all probability, achieve something definite. It aims at fixing the maximum number of hours to be worked per day at eleven, excepting Saturdays and the days before holidays, when the number is limited to ten. Out of these, regular intervals will be granted for meals, &c., at least one hour at mid-day being allowed for dinner. Consideration of the different classes of labour will be dealt with by the Federal Council, whose decisions are to be subject to the approval of the Reichstag. Under the present statutes, children between the age of twelve and fourteen are allowed to work six hours per day. If Herr Hitze's proposal becomes law, it will be punishable to employ children of a less age than fourteen years. As regards female employment, the bill simply proposes to suppress altogether night work for women.

Trade with the Spanish West Indies.

British trade with these islands, it will be remembered, enjoys the benefits of the duties fixed by the third or most favourable column of the tariff for foreign goods, in virtue of most-favoured-nation treatment, consequent upon the provisional arrangement entered into last October between Spain and the United States. This arrangement expired on the 31st ultimo. Congress has separated without any conclusion having been come to respecting the negotiation relative to trade with the West Indies which was contemplated last autumn. It is understood, however, although no formal announcement has yet been made, that the Spanish Government will prolong the agreement of last October for a further period of three or six months from the date of its expiry, and it is a matter of importance to British trade, quite as much as to that of the United States, that this arrangement should be extended and made permanent.



The Trade of the World.

[From Special Telegrams and Sources of News all over the World.]

THE GERMAN JUTE TRADE.—At a meeting of the German jute manufacturers, held in Gera, it was decided to raise the price of all jute textile fabrics.

A SPANISH COLONIAL EXHIBITION.—An exhibition of the products of the Philippian Archipelago will be opened in Madrid on June 1st next. It promises to be of the most comprehensive kind.

THE HAVRE EXHIBITION.—The prospects of the International exhibition which is to be held this year at Havre seem to be brightening. Nearly 2,200 applications have been received from intending exhibitors.

THE FRANCO-ITALIAN TREATY OF COMMERCE.—Our Roman correspondent informs us that, in spite of announcements to the contrary which have appeared in the public press, Italy has so far made no new proposition to the French Ambassador in that city—M. de Mouy—with respect to a new treaty of commerce between the two countries.

THE GERMAN COTTON INDUSTRY.—The general meeting of German cotton spinners just held at Dusseldorf has been followed by a second at Gladbach. Many delegates from the spinning mills of Westphalia, the Rhine, and Hanover, were represented. The resolutions passed at Dusseldorf were ratified without dissent, and applied to tariffs of prices and conditions of sale and purchase. A hope was also expressed that the railway rates from Bremen would be reduced.

TRADE IN BEYROUT.—A private correspondent at Beyrout forwards elaborate details respecting this trade, and closes by stating that a marked diminution has taken place in the importation of French goods, owing to the competition of Germany and Austria—a competition which is based on cheapness, to the detriment of quality. During the last ten years the Syrians have shown a marked predilection for all articles that combine cheapness with a good appearance, quality being left out of the question.

TRADE POSSIBILITIES IN TONKING.—No less than 4,000 tons of goods, intended for the Hanoi exhibition, were forwarded in two steamers to that port. French syndicates, numbering from 20 to 30 members each, have sent delegates to look after their interests, and to furnish them with accurate information as to the needs and productive resources of the colony. A railway is to be constructed from Hanoi to Laoki. At present, the latter town can be reached by the Yellow river only, the voyage occupying 35 days, and being attended with much inconvenience and danger. The mercantile community in Tonking feel aggrieved by the high freights charged by the Messageries Maritimes for cheap goods conveyed from there to Europe by that company's steamers. So crushing are these charges that goods intended for exportation have to be forwarded to Hong Kong, and shipped from there in English and German bottoms, to the detriment of the French shipping interest. An attempt will probably be made before long to induce the French government to bring pressure to bear upon the Messageries Maritimes to change this state of things.

THE COMMERCIAL CRISIS IN CATALONIA.—It is stated that the commercial crisis through which Catalonia has been passing for the past two years is daily increasing, and that the protectionist party attribute this evil to the action of the Spanish Government with reference to the so-called "free trade" treaties of commerce. But, in spite of these treaties, the element of protection remaining is strong enough to enable the Spanish manufacturer to maintain a successful competition with any foreign producers, provided, always, that his manufactured articles do not fall below the level of those sent into the country by foreigners. It is a fact that goods imported into Spain from England, France, and Belgium, cannot be obtained in Spain at the same price as the same articles manufactured there. The Spanish manufacturer, therefore, has only to produce goods equal in quality to those of which he complains, and a large profit is at his command. The manager of a large textile establishment in Catalonia, one of the most eminent firms in Spain, recently explained to a visitor that he could not obtain, in certain shades, the necessary fulness of colour, and that he was, therefore, compelled to purchase dyed yarns from Roubaix, and weave them in his factory.

GERMAN TRADE IN CENTRAL AFRICA.—A Berlin correspondent points out that up to the present time, Germany has had only a small share of the Central African trade. The attempt made last year by the Central Association for Commercial Geography to found trade settlements on the North-West Coast of Africa failed completely. The object this company had in view was to work from the West Coast inland, and to create business in Central Africa, especially in Timbuctoo on the Upper Niger. The carrying out of such an idea is much more practicable, however, in the Togo country. At the present time, the traveller, Aurel Schulz, has undertaken an expedition from Togo, via Mossi, to Timbuctoo. The Germans hope that, in time, regular communications

will be established, which may be of great importance to German trade. At any rate, Timbuctoo is more easily reached from this point than from Morocco, by the desert of Algiers, which the French propose to cross by a railway. The route from the Togo country to Timbuctoo is far shorter, and passes through a populous and fertile country; but it is yet to be ascertained whether the natives are friendly towards Europeans, and whether it is possible to open a trading route from the Togo country to Timbuctoo without danger. Should it be practicable, Timbuctoo, which has fallen behind very much in commercial respects, might gain a great deal, and owing to its favourable situation might again become the chief emporium of the Central African trade. Of course, some European power would have to intervene, so as to maintain peace there, for at the present time a dangerous state of uncertainty exists, owing to the Tuarik fighting the Fulbe. If some strong company could manage to establish safe communication between the Togo country and Timbuctoo, the German export trade thinks it would find a very important market, as the natives of Central Africa are already somewhat civilized, and have many wants which could be satisfied from Europe. The German trade is advised to keep this in view, and its members or representatives are told that if this is done they will probably be more successful than the French have been with their plans in the same country. The latter, with their policy of annexation, are intensely hated by the natives, and the many attempts made by French explorers to reach Timbuctoo have hitherto always failed, simply because those explorers were Frenchmen. On the other hand, Dr. Oscar Lenz met with a very friendly reception in Timbuctoo, and it is, therefore, not impossible that the Germans may penetrate into the interior from the Togo country more successfully than the French have done.

THE PRINCIPAL ARTICLES OF TRADE.—Amongst the principal articles of trade are large blue skirts, embroidered with silk, also thick bluish white coverlets, blankets, and trousers, made of blue stuff and embroidered. The article exported by the English is of wretched quality, though cheap, and can easily be supplanted. At present, most of the articles imported from Europe come in caravans from the north, the most important being cloth and blue cotton stuffs, green Chinese tea, sugar, candles, and small wares. The export articles are ostrich feathers, india-rubber, gold, and ivory, but the last mentioned is sent out only in small quantities. Unfortunately, the slave trade is still in a flourishing condition there and great numbers of slaves are sent to Morocco and Algiers. As most of the business goes at present to the north, the camel plays the principal part in the process of transportation—about 5,000 camel loads being, it is said, despatched every year from Timbuctoo to the two last mentioned places. The English, who also have their eyes upon Central Africa, have penetrated from the mouth of the Niger to Benue. The French proceed along the Senegal with designs upon the Upper Niger. Germany has hitherto done nothing to gain a footing in Central Africa. North of the Togo country, there are many important commercial towns with which the Germans should enter into communication. If Dr. Aurel Schulz succeed in obtaining accurate information about the condition of the country between the Togo district and Timbuctoo, the Germans hope that they may be able to enter into competition with the English and the French in Central Africa, and perhaps outstrip these rivals.

GERMAN ENTERPRISE IN SYRIA.—In an English report, recently published, Mr. Dickson, our representative at Damascus, observes that, as regards foreign competition, British manufacturers should not trust to circulars, but should send out travellers. This is, of course, the old cry; but he goes on to mention that, during the whole of last spring and summer, there was in Damascus a German representing an engineering firm at Berlin, who endeavoured to introduce agricultural machinery into Syria, and would doubtless have succeeded if the threshing machines had not broken down during the trial. He had at the same time the offer of the contract by the municipality of Damascus, for constructing a tramway in the city, and he may still make arrangements for carrying it out as soon as it has been decided upon. A few days before the report was written, a French gentleman, from one of the manufacturing firms in Lyons, signed an agreement for setting up a silk and cotton manufactory in Damascus, and he has now returned to France to procure the requisite machinery. The greater part of the silks made in the place are exported to Cairo, Smyrna, and Constantinople, and are used for wearing apparel, and in house-furnishing; but the cotton cloths meet with a ready sale in the country itself, being largely purchased by the poorer classes and by the peasantry. Manufacturers wishing to do good business in Palestine ought to send silk goods there of an inferior quality, and for the most part such as are mixed with cotton. Such things could compete successfully with the finer articles, which are very dear. We see that an Italian writer strongly recommends this course to his compatriots.

SOME OF THE DIFFICULTIES IN THE WAY.—Goods imported from England direct to, say, Mosul, are often five or six months in transit, before they have reached their destination. In the meantime, prices have changed, and what would have been a prosperous transaction at the time, may turn out, in the end, to have been simply a ruinous speculation. For this and other reasons, direct importations into Asiatic Turkey have almost ceased. Formerly, there was a very considerable trade at Mosul with Persia, for instance, and the distant towns of Kerkook and Suleimaniye. But these places are now supplied directly from the Bagdad market.

Consular Reports.

A CHANCE TO CREATE BRITISH TRADE.—Mr. Consul Rainalds repeats a suggestion he made—we think two years since—that the trade between Great Britain and his district—that of Brest—could not fail to be considerably increased by the establishment of direct and frequent steam communication between Brest and a British port. The Consul has had considerable correspondence on the subject with English and Welsh merchants and shipowners, and he has given them the fullest information, with statistics, but he has felt it only right to call their attention to the fact that the opening of such steam communication will probably, at the commencement, be a losing business, but that after a time, it cannot fail to prove profitable, not only to the shipowner, but to traders in general. The departments—Finistère, Côtes du Nord, and Morbihan—could, after a little time, produce large quantities of articles required in England, such as cattle, horses, farm produce, &c. His correspondents, however, have not appeared disposed to commence an undertaking not yielding immediate profit, and that cannot be expected, as trade will have to be created. British shipping continues to be hampered by the ship brokerage difficulties, and Mr. Consul Rainalds says there is no doubt that a considerable increase, in the direct importation of coal and other articles from English and Welsh ports in British vessels, would be the result of the abolition of the present practical monopoly, or the modification of absurd privileges.

COMMERCIAL MUSEUM IN FRANKFORT.—M. Eugène Bœufvé, French Consul-General at Frankfort, has paid a visit to the new commercial museum established in the city, which he reports as being in a fair state of development. Samples have been collected in some instances, simply by the payment of transport and other charges, whilst others have been obtained by purchase through German Consuls abroad. At present, the collection is located in the upper galleries of the Bourse, but it is not yet divided into geographical classes or generic divisions. So far as could be ascertained, there are not many European goods amongst the samples, but M. Bœufvé found English textiles sold in Chili; English textiles supplied to China, and German textiles and Belgian wax candles; cotton goods from England in Colombia and French tissues; English textiles, Austrian buttons, and French lace sold in Java. English paper sold on the Gold Coast, and English and Indian cottons sold in Hawaii. M. Bœufvé was favourably impressed with his visit, and thinks that when fully organised, the museum will prove of great use and assistance to German manufacturers. As he points out, the museum is absolutely distinct from the organisation entitled the Frankfurter Export Musterlager, the former being destined to show what is made and consumed abroad, the latter having for its object, the display of German goods for foreign purchasers to examine, and to push the sale of the same in other countries.

NATIVE CLOTH IN PAKHOI DISTRICT.—Pakhoi, Mr. Consul Allen says, is the port of import of a district lying just within the tropics—a district neither rich nor populous—in which the common people are but imperfectly acquainted with European manufactures and the resources of civilisation generally. Those who can afford to buy woollen goods or silk textures are but few in number. Even wadded cloths are rarely seen in winter, though the severity of the cold season would astonish those who believe that residents in the tropics enjoy summer all the year round. The costume of the common people is therefore almost universally clothes of cotton cloth. This cloth may be divided into three kinds—1. Foreign cloth, such as grey shirtings, T cloths, &c., 2. Homespuns of Indian yarn. 3. Homespuns of imported Indian or Chinese raw cotton. Foreign fabrics are mainly worn by the merchants and well-to-do classes of the towns, while the poorer townspeople and all the country people wear the homespuns. Foreign cottons are of course for sale in the shops, but strange to say, there are no shops for the sale of the native homespuns. Each village or hamlet appears to supply its own needs only. A number of samples are sent home with the report, no comparison with British goods being made, that being left to those concerned. Mr. Consul Allen is “firmly convinced that Manchester goods to take their proper place in this, as in other markets in China, must be honest stout stuffs, such as Chinese peasants can wear and wash for years.”

EGYPTIAN TRADE.—Mr. Consul Cameron, at Suakim, says, in his report for 1886, that there was no trade with the interior. There is, however, every prospect of trade with the friendly sheiks soon being reopened. “The question of when and where to reopen it is a political one, but as soon as public permission is given, I am confident that there are, at Suakim, European traders who will be ready to begin, under the care and protection of the Government, at certain creeks and harbours on this coast. The three best known harbours are Suakim itself, Rowaya to the north, and Agig to the south. The lagoon salines of Rowaya have been let by contract to a wealthy native merchant for a term of five years. In a few months, as soon as the salines are in working order (the report is dated 19th January, 1887), I am very hopeful of a genuine trade in cloth and grain springing up at Rowaya. With regard to Agig, it is possible that before long the sheiks of Tokar will make their peace with the Government.” As showing the serious effect on trade of the stoppage imposed by the British occupation, it is only necessary to state that the total exports in 1886 were valued at £8,300 (of which £4,000 was for goods returned as unsaleable; being remnants of British troop supplies), compared with £127,263 in 1883; while the imports fell in the same

period from £288,054 to £95,500. British imports decreased from £91,044 to £13,800, and the exports taken by this country diminished by over £83,000—viz., from £84,855 to £1,300.

TRADE AT ZANZIBAR.—The Belgian Consul at Zanzibar says that without doubt there is a considerable trade in certain articles to be done on the East Coast of Africa, where at present the natives buy principally of English and German goods—ignorant, according to the Belgian Consul, of the country of origin. The best method to work the district around Zanzibar would be to form a strong agency representing the producers of different specialties to join with importing houses so as to ensure return cargoes. Only merchandise of good quality should be sent, and if this conform with the tastes and requirements of the customers, there will be a rapid gain assured of good clients. At the head of the agency should be placed an active, intelligent, honest, and well-informed man, who would devote all his attention to his work.

ADVICES FROM ITALY state that some time since the Italian Minister of Commerce invited the merchants and manufacturers of the kingdom to forward, either direct or through the commercial museums of Milan and Turin, samples of their articles of goods, to be conveyed at his cost to the Italian Chambers of Commerce abroad, to form the basis of permanent exhibitions of their productions. More than forty houses responded to the appeal, and the samples thus collected have been transmitted to the Italian Chamber of Commerce at Buenos Ayres, to form the first of this proposed series of exhibitions. The Minister of Commerce has decided, owing to his success, to make a second effort in the same direction.

INDUSTRIAL CONDITION OF RUSSIA.—A statistical work having been recently issued in Russia, based on official returns as to the distribution and activity of the industries of European Russia, Mr. H. M. Dering, of the British Embassy at St. Petersburg, has prepared a summary of the principal features, from which a table has been compiled, giving the pith of the report. We extract the portion that will be interesting to our textile readers.

Industry.	No. of factories.	Hands employed.	Annual value of productions.
			£
Spun wool	68	4,789	517,300
Carpets	9	802	55,000
Cloth	390	48,000	4,076,900
Woollen and Mixed Tissues ..	190	19,000	2,112,500
Wadding (cotton wool) ..	53	—	85,400
Cotton spinning	67	116,494	11,250,000
Cotton goods	488	80,500	5,596,000
Flax spinning	24	20,780	1,527,200
Linen	87	15,500	786,000
Silk	*148	10,845	762,500
Embroideries	112	2,625	268,000
Ribbons	13	—	60,500
Dyeing	590	29,750	5,555,600
Rope	308	7,100	620,700
Hats	29	740	100,000
Paper	140	13,300	1,469,700

The total products of the various industries in European Russia in 1884 may be stated as having been worth £152,145,300 from 33,815 manufactories, employing 932,094 workmen. As compared with 1879, the number of manufactories has diminished by 959, whilst the value of the productions has been augmented by £23,109,100, and the number of workmen employed by 71,065. These figures do not include the so-called minor industries, which, scattered all over the country, play no unimportant part in its commercial development.

Consul M'Guffie at Puerto Plata, Santa Domingo, commences his report by reference to the dulness of trade, and after giving some statistical information showing the falling off of trade, goes on to say that he does not consider that agents are responsible for this falling off. “The British commercial travellers coming under his notice could not be excelled by foreigners; and no foreign agent is superior to them in linguistic attainments. Manufacturers, he thinks, should produce cheap and tawdry goods to suit the tastes and pockets of their far-off customers. If this suggestion has any force, the commercial travellers are certain to communicate the fact to their employers.”

* Large factories only.

Book Notice.

THE IRISH TEXTILE DIRECTORY FOR 1887. Compiled by F. W. Smith. Marcus Ward and Co., Limited, Belfast, London, and New York.

This directory gives a reliable list of the firms engaged in Ireland in the different branches of the textile trades, and of those engaged in the linen, flax and hemp trades in England and Scotland. It also contains statistics relating to the imports into, and the exports from, the United Kingdom, of flax, &c., during the past few years, and a comparison of the number of spindles and looms engaged in this special manufacture in the United Kingdom and the different countries in Europe. The lowest and highest average prices of Irish flax and yarns, from 1852 to 1886 inclusive, are appended. As a directory specially compiled for those interested in the flax, hemp, linen and jute trades, it will be welcomed by all those concerned, and it will, undoubtedly, have a large sale. It is got up in a neat and handy form at a low price.



ORIGINAL ✕ DESIGNS.

Our first plate shows a design for a Tapestry Fabric, which has been drawn by Mr. R. T. Lord, 97, Park Road, Bradford.

* * * *

On our second plate are two small figured designs for Ladies' Dress Materials. The first one is intended as a stripe to be worn with a plain coloured material. We are unable to show more than a section of this pattern, but it will easily be understood how it is intended to be employed. On the left, the design terminates in a vandyke and plain stripe. The vandyke is intended to run down each side, the complete width of the figured stripe being left to the choice of the manufacturer, as also is the plain stripe. The second of these patterns could be used in a similar manner. In each case, a coloured weft should be used. These designs are the productions of Mr. R. T. Lord.

* * * *

On our third plate, we give another design for a Tapestry Fabric, specially arranged for varying shades of colour. The flowers are placed in such positions that no fewer than six different colours of weft can be employed, and, therefore, a good effect may be easily attained. This design has been drawn by Mr. R. T. Lord.



MONTHLY TRADE REPORT.

Wool.—At the London wool sales, the attendance has been good, and the biddings for most descriptions animated. The average of prices has been about that of last sales. The present series will close on the 27th instant. In the Yorkshire and Scotch districts, there is little change to note since last month, prices have varied but little, and the quantity of wool sold has been mostly for actual requirements, and, therefore, any attempt on the part of dealers to advance rates has caused users to hold off the markets unless they were in need of the raw material. In the yarn branch, there was a general complaint of the scarcity of orders early in the month, but prospects revived a little towards the close, and numbers of orders were given out, which, although small in quantity, were, nevertheless, acceptable to many spinners who were running out what they had on hand. On the whole, spinners are not satisfied with the present state of things, as prices are not to their liking. The piece trade, both for home and export account, has been somewhat restricted in demand, and prices have ruled against manufacturers. In the Bradford district, some admirable specimens of dress fabrics have recently been produced, but, with slight exception, the orders for them have been small in volume, and merchants seem indisposed to pay a fairly remunerative price for any goods they fancy.

Woollen.—The districts in which this branch of industry is carried on are having, on the whole, a favourable time as far as work is concerned. Full time is still the rule, and overtime is run by some firms in the Huddersfield and Leeds districts. In some less favoured places short time is being run, but this is the exception. Fancy worsteds in fine yarns, with good colourings, still take the lead, and have met with much favour. The plainer classes of fine fabrics have also been in good demand, and the outlook seems particularly bright for the future of the branch. Medium and low class worsteds have also met with a fair amount of attention at prices of a paying nature, although there is much competition, and buyers are generally keen in driving bargains. The woollen classes of cloths have been purchased on order fairly well during the past month, the better descrip-

tions in checks, stripes, &c., in well finished and fancy patterns, meeting with most favour, whilst low goods, for the ready-made clothing trades, have had a good demand. Medium qualities have also sold moderately well. The tendency in nearly all classes of cloths is for bright effects in colourings, and, in this respect, some excellent fabrics are now in the markets. The patterns of the better classes of cloths for the spring of next year are now taking the attention of manufacturers, and it seems likely that some great advances will be made in varied qualities of fabrics during ensuing seasons.

Cotton.—There has been an increased demand for the raw material, prices having hardened in consequence for most descriptions, and there is the prospect for the immediate future that values will go higher. In sympathy with this, the yarn trade has improved, spinners having generally held out for higher rates, and, except in cases where a good stock of yarns is on hand, they have been indisposed to sell at old rates. Manufacturers, through the hardening of raw material, have been placed in an unenviable position, as it is with difficulty that they can procure a corresponding rise in the prices of their goods, and, in consequence, the piece trade has been quieter, as far as new orders are concerned. Manufacturers, who are still working on old orders, prefer to abide events to taking orders at late prices. Merchants, on the other hand, have not generally conceded an advance in price, hoping that they may induce the producers to accept old rates. On the whole, the cotton trade is not unhealthy, even with this excessive keenness in regard to price. The volume of business passing being an average one.

Linen.—This branch of industry has been fairly satisfactory on the whole. In some departments, an improvement has taken place, whilst in others there has been a falling off. In fancy damasks, more has been done, and prospects are decidedly brighter. The least cheering feature is that the demand for America is not satisfactory, but is less than usual at this time of the year. Tea cloths and towellings, in fancy fabrics, have sold well at better prices, and sheetings have also met increased favour. Full time is running in many establishments, but this is anything but general, and in the trade, therefore, there is much room for improvement.

Lace.—This branch of business is about on an average with the last two or three months. The curtain and window blind departments have improved; although prices do not satisfy producers, still there has been a slight amendment in this respect. Laces for millinery purposes of a fancy character have been in demand, and some really excellent goods have recently been put before buyers, and have met with much attention. The bobbin net branches have been rather quiet, and the output of goods has, in consequence, been restricted. Embroideries and trimmings for summer wear are meeting with favour, and fair orders have been secured for this class of goods.

Lace Making at Bruges.

The thread comes entirely from Nottingham, as no sufficiently fine machine-made thread can be found in Belgium; while the cost of the fine hand-made thread used for Brussels lace is so enormous as to make it useless for any but the finest laces. The latter thread is spun in dark underground rooms, from flax grown at Hai and Rebecq-Rognon; and has been known to fetch the astounding price of £500 per lb. The thread and the patterns are supplied by the lace manufacturers, for whom all the work is done; and the *dentellicres* are not allowed to sell an inch of it themselves. They are paid by the piece, and a miserable pittance they earn. A very *vaillante* worker, by working from 7 a.m. to 7.30 p.m., can earn 1 franc 25 centimes a day; but this is not often done. The greater number gain 40 to 80 centimes a day. The sister showed us the best worker in the school, a gentle, bright looking girl of twenty-five, with beautiful hands—as indeed they all have—and stooping, contracted figure—as, alas! they all have also. She was making a magnificent piece of Valenciennes about seven inches wide, deeply scalloped, with a large spray of closely worked flowers in each scallop. We asked how much she could do in the week, and she answered “one pattern,” about seven or eight inches, that is to say, barely a yard in a month.—*Art Journal*.



TAPESTRY.

THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

19TH APRIL, 1907.

DESIGNED BY R. T. LOR.



DESIGNED BY R. T. LOR.



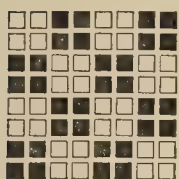
TAPESTRY



Woollen Suitings.

No. 440.

Warp :—



2 ends White, 2/20 skeins woollen.

2 „ Black, 16 „ „

Weft :—

1 pick White and Canary Mixture, 10 skeins woollen.

1 „ Dark Blue, 16 skeins woollen.

1 „ Black, 20 skeins twisted to Crimson, 20 skeins knob twist.

1 „ Blue, 16 skeins woollen.

Design.

1,792 ends.

28 „ per inch.

26 picks per inch.

2 ends in a reed.

14's slay.

64 inches wide in the loom.

56 „ when finished.

Straight Draft.

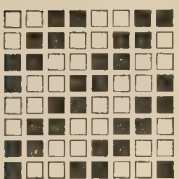
Velvet finish.

Weight 20 to 21 ozs.

The White and Canary Mixture is not made in the ordinary way of mixing, the Canary being scattered or dropped amongst the White in the process of scribbling. The Black and Crimson knob twist is not made in the ordinary way, the peculiarity of this yarn being that it is spun hard and soft alternately.

No. 441.

Warp :—



3 ends Brown, 20 skeins woollen

2 „ Canary, 20 „

3 „ Brown, 20 „

1 end Crimson, 2/40 „

6 ends Black, 20 „

1 end Crimson, 2/40 „

3 ends Brown, 20 „

2 „ Canary, 20 „

3 „ Brown, 20 „

1 end Blue, 20 „

6 ends Black, 20 „

1 end Blue, 20 „

} Twice.

Design.

Woven as warped.

2,944 ends.

46 „ per inch.

42 picks „

4 ends in a reed.

11½ slay.

64 inches wide in the loom.

56 „ when finished.

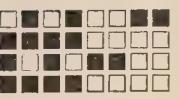
Straight Draft.

Weight 18 ozs.

Finish soft and mellow.

Fancy Worsted Trousering.

No. 442.



Warp :—4 ends 2/48's on one beam.

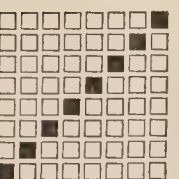
1 double end of 2/60's

2 ends of 2/40's silk

1 double end of 2/60's

} For face
on separate
beam.

Design.



84 picks of 2/28's.

16's slay, 4 in a dent.

66 inches wide in the loom.

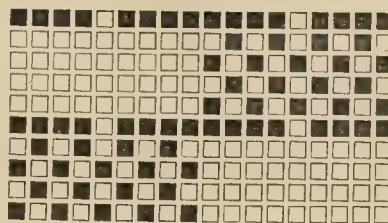
56 „ when finished.

Draft.

Lift Black.

Mantle Cloth.

No. 443.

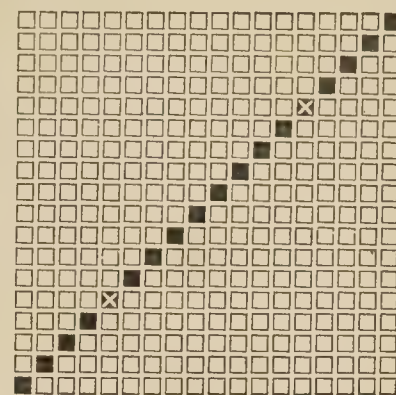


Design.

■ Double beam 2/40 Egyptian cotton.

☒ 2/30 Egyptian cotton.

Draft.



Face warp :—2/40 Egyptian cotton.

☒ Backing :—2/30 „ „

Weft :—10 skeins mungo of fairly good quality.

Picked :—4 woollen.

1 knop worsted or mohair. For Self colours, Fast Black.

15 sett.

2's reed.

50 picks per inch.

58 inches wide in the loom.

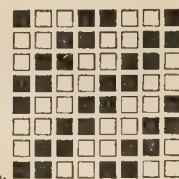
52 „ when finished.

The pattern for Mantle Cloth has been designed by Mr. John Barrett, of Savile Town, Dewsbury, a gentleman who has just commenced business as a manufacturer, after spending many years as a designer, and having studied at the Yorkshire College, Leeds.

Woollen Suiting.

No. 444.

Warp :—



Design.

1 end 40 skeins White

1 „ 60 „ Light Blue

1 „ 60 „ Fawn

1 „ 40 „ Black.

1 „ 40 „ White

1 „ 60 „ Light Blue

1 „ 60 „ Fawn

1 „ 40 „ Scarlet.

1 „ 40 „ White

1 „ 60 „ Light Blue

1 „ 60 „ Fawn

1 „ 40 „ Black.

1 „ 40 „ White

1 „ 60 „ Light Blue

1 „ 60 „ Fawn

1 „ 40 „ Black.

} Twisted.

} Twisted.

} Twisted.

} Twisted.

Woven :—

1 Pick Black twisted with Blue and Yellow.

1 „ Black.

1 „ Black, Blue and Yellow.

1 „ Black.

1 „ Black, Blue and Yellow.

1 „ Black.

1 „ Black, Blue and Yellow.

1 „ Black.

1 „ Black, Blue and Yellow.

1 „ Scarlet.

1 „ Black, Blue and Yellow.

1 „ Black.

Weft all 40 skeins.

2,720 ends.

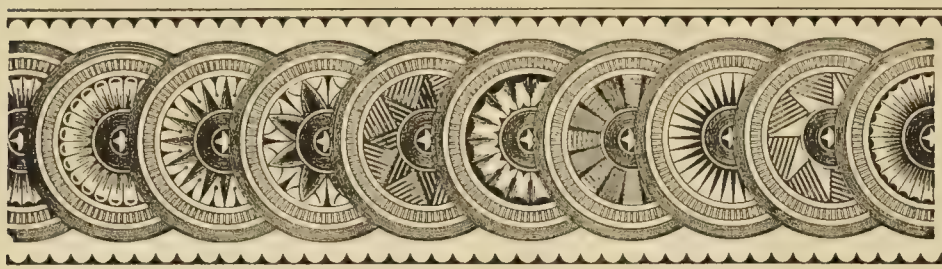
40 „ per inch.

40 picks „

10 reeds 4's.

68 inches wide in loom.

56 „ when finished.



MACHINERY * TOOLS, * & C.

Messrs. Crighton and Sons' Improvements in Textile Machinery.

The great value of Messrs. Crighton and Sons' improvements in textile machinery is of such importance to the cotton spinning community generally, that we have pleasure in presenting to our readers a description of some of them. This enterprising firm, which carries on an enormous and

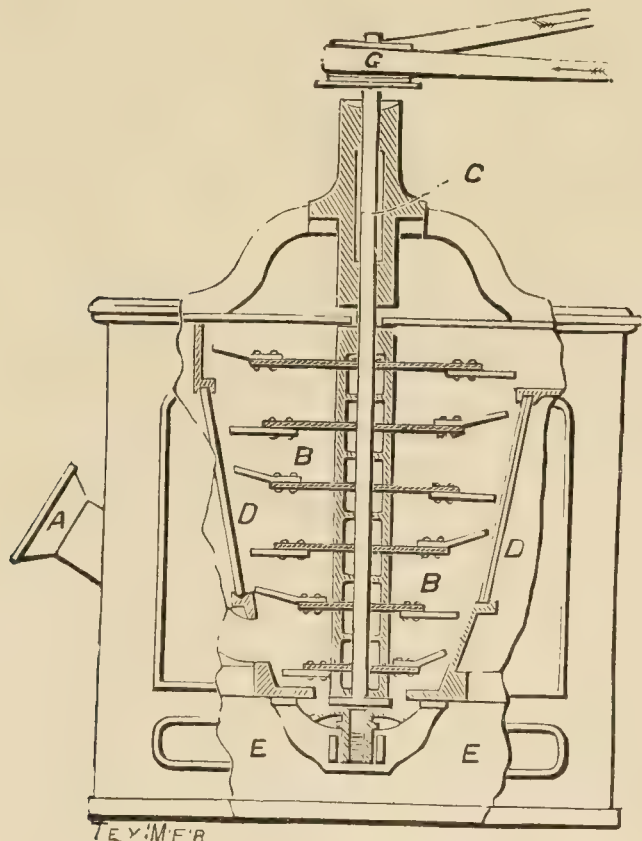


Fig. 1.

ever increasing business, at their Castlefield Ironworks, Knot Mill, Manchester, was established early in the present century; Mr. John Crighton, the founder of the house, invented and made, in 1814, the well-known lapping apparatus applied to a scutcher. It is a remarkable fact that little change has been made in the construction of this apparatus since its introduction so many years ago. This speaks volumes for the perfection of the

opener, with single beater lap machine, for making laps for the carding engines, with "Crightons' patent leaf extractor," and improved porcupine feed table to opener. With this machine, which is very extensively adopted by spinners of all classes of cotton, perfectly regular and even laps are obtained. The cleaning power of the opener, with Crighton and Sons' principle of porcupine feed table, is unequalled, so that many spinners having this machine take the *laps direct* from it to the cards. The patent leaf extractor, between the scutcher beater and the cages, is one of the most simple, yet useful, appliances for the extraction of the leaf from the cotton, and is described below. This combined opener, used in conjunction with an intermediate and a finisher lap machine, is sufficient to clean satisfactorily the lowest class of Oomra and Dhollerahs, whilst for American cotton, only one lap machine is required in addition to the combined opener. The construction of Crightons' cotton opener is illustrated in Fig. 1, which shews a section thereof. A vertical shaft C, carries a series of wrought-iron discs of gradually increasing diameter and rigidity, kept at proper intervals apart by distance pieces. To each wrought-iron disc are rivetted several radial arms or beaters, BB, of steel; some of these arms are straight and some are bent upwards. The discs and beaters revolve in a grid, D, shaped conically, with the largest diameter at the top. The grid is made in several sections, each section being a cast-iron plate, ribbed to suit the particular kind of cotton or mixing to be opened. It is evident that, by lifting the shaft C, the distance between the tips of the beaters and the grid can be so altered as to answer for various lengths of staple. This method of obtaining the object was adopted in the earliest make of this machine, many years since, by the inventors and makers, Messrs. Crighton and Sons, but has long been abandoned, and is not now recommended, the adjustment indeed, being rarely needed, and in some cases not at all. When, however, such becomes necessary, it is considered advisable to substitute the grid by another one, which may, if desired, be made differently in the three points of size of ribs or corrugations, size of perforations, and also in distance from tip of beater arms. With such a range of variation, it can be seen that it is possible to meet with exactness every requirement, according as the quality of the mixture varies. The substitution of a fresh grid is but the work of a short time, and it has the advantage that, being a fixture, it can be removed out of the reach of that genius who may be craving for experiment, which sometimes, with disastrous results, characterises the operative. It is curious to note how some people, when they see a handle or a hand wheel, are impelled irresistibly to turn it; of such we can give several instances, both amusing and the reverse. On this ground, therefore, the fixed grid is an undoubted advantage. The draught required to send the cotton through this machine is supplied by its own rotation. In English mills, where the opener is usually placed on the ground floor, the cotton is supplied by the mouth A. The important feature of this opener is that it is selective or discriminating in its action; it will not operate upon the cotton to any extent greater than is demanded for its perfect opening, and this occurs in this way; the material is first acted upon by the beaters on the lower disc, and then rises, passing from beater to beater, until it is discharged with the current of air through the opening at the top of the right hand side. If the cotton be fairly open to begin with, the passage through the machine will be rapid; supposing, however, there are lumps and clots present, these, by reason of their great density, will not rise so rapidly, and, in fact, will not be discharged until they are taken up and thoroughly opened. This is the characteristic feature of this opener. The dirtier kinds of cotton are usually the more densely packed; for instance, American cotton, which is tolerably clean, is also comparatively loose, requiring little opening, whilst Surat, which is commonly dirty, is also densely packed. This fact is discriminated by the opener, for the latter is longer operated upon. In this way, the material runs the least risk of damage consistent with obtaining the desired result. During the process, the seed, shell, sand, and foreign matter, will either be projected outwards through the perforations in the grid, or they will fall to the bottom into the space C E. The cotton may be then passed through a lap machine, or may be allowed to fall loose upon the floor. We will now refer to the patented arrangement in Fig. 2, in which the opener is com-

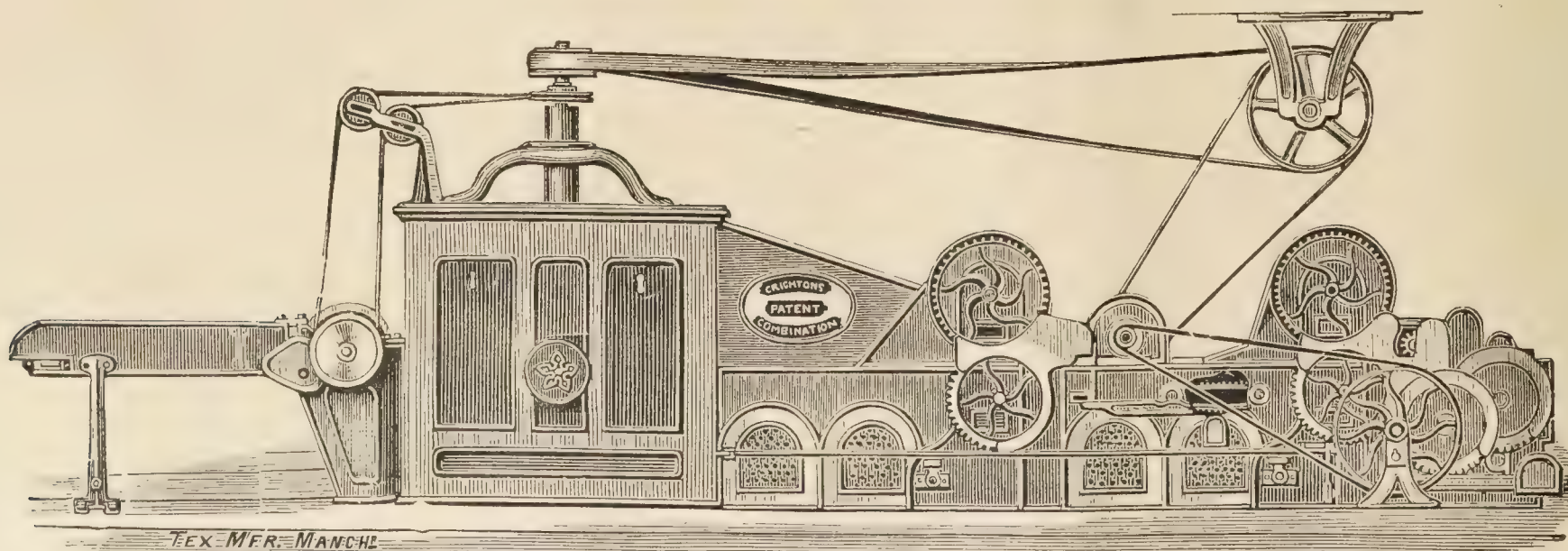


Fig. 2.

invention, and with this fact in remembrance, it is no wonder that "Crighton," in the cotton world, is a name as familiar as a household word. One of the principal machines made by this firm is the Crightons' patent combined

combined with a single beater lap machine. The cotton is fed on to the lattice at the left hand end, and passes, first, through a pair of rollers with a porcupine cylinder in front, driven from the beater shaft, as shown. The purpose

of these is to partially open the fibre so as to allow the grosser impurities to fall. The final opening and cleansing are effected in the opener itself, into which the draught draws the cotton from the porcupine cylinder. After the passage through this portion of the machine, the material is partially projected, and partially drawn, upon a pair of cages, between which it passes, to a pair of feed rollers, and is presented to the action of the scutcher beater, where it receives further cleaning, after which operation, it travels loosely over the patent leaf extractor to a second pair of cages, and thence to the lapping apparatus, where it is rolled into a lap for the next operation. The most noticeable point in connection with the lap machine is Messrs. Crighton and Sons' patent leaf extractor (applied by them to all their scutching machines) which substitutes the ordinary grid between the beater and dust cages. The leaf extractor can be partly seen in Fig. 2, a part of the machine side being cut away to make it visible; it consists of a series of lattice bars attached to a travelling apron, or band of cloth, of the full width of the machine between its sides, thus forming a series of dirt boxes with air tight bottoms. It is obvious that this plan prevents the wind from the beater rushing down between the bars and carrying good fibre with it; the traveller is driven from the cage by means of a chain, and runs in an opposite direction to the cotton, thus catching the leaf and dirt and depositing them on the floor underneath the machine. As the fibre is not driven down between the bars, the dirt merely falling between them, they are made with much wider spaces than usual, leaving room for the extraction of larger pieces of leaf, which would otherwise be carried forward with the cotton, and being broken into smaller portions by the next operation, would be much more difficult to extract. Messrs. Crighton and Sons' improved mule headstock (see Fig. 3) gives a view of this splendid specimen of their manufacturing skill. In this machine, Messrs. Crighton have made various modifications that, in themselves, are well worthy the attention of spinners, independently

spun be long or short. This point may be made more clear by citing a common case. Usually, by substituting the change wheel in the mandoza with a wheel having one tooth more or less, the gain of the carriage is altered by about $1\frac{1}{4}$ inch to $1\frac{1}{2}$ inch, which spinners consider too large a variation in many instances, but by making the change wheel of finer pitch, it is obvious that the drag or gain can be adjusted more finely. In the mule under notice, for instance, the alteration in the drag, due to the alteration of one tooth in the "finer" change wheel, is actually half the ordinary amount, or about $\frac{3}{4}$ inch, the pitch of wheels and number of teeth being arranged to give the result. The last improvement that we have to notice is, perhaps, the one of greatest value; it consists of a positive method of knocking the taking-in friction out of gear in cases where, from any reason, the cam shaft fails to make the change when the carriage is being drawn in. The taking-in friction clutch actuates the taking-in scrolls, and draws the carriage in. Supposing the incline on the change lever was to slip its slot, and, therefore, to miss operating on the cam shaft, or that the catch box spring in the cam got out of order, or that any part of the mechanism was to stick fast and that, at the proper moment, the taking-in was not released, the result would be breakage of bands and machinery. This is guarded against in the following way:—A lever is pivoted on the right hand side of the headstock frame, and connected with the rocking shaft of the motion for working the taking-in friction clutch. If, from any reason, at the end of the winding, the cam shaft missed its change, and the carriage travelled half-an-inch beyond its proper limit, the lever, we have mentioned, will be struck by the faller shaft, and the taking-in friction put out of gear. Thus, no mishap can occur, for the same would happen at every draw until the cam shaft was set right again. In addition to being the inventors and original makers of the "scutcher lap machine," Messrs. Crighton and Sons also manufacture and supply the following:—Improved roller cotton

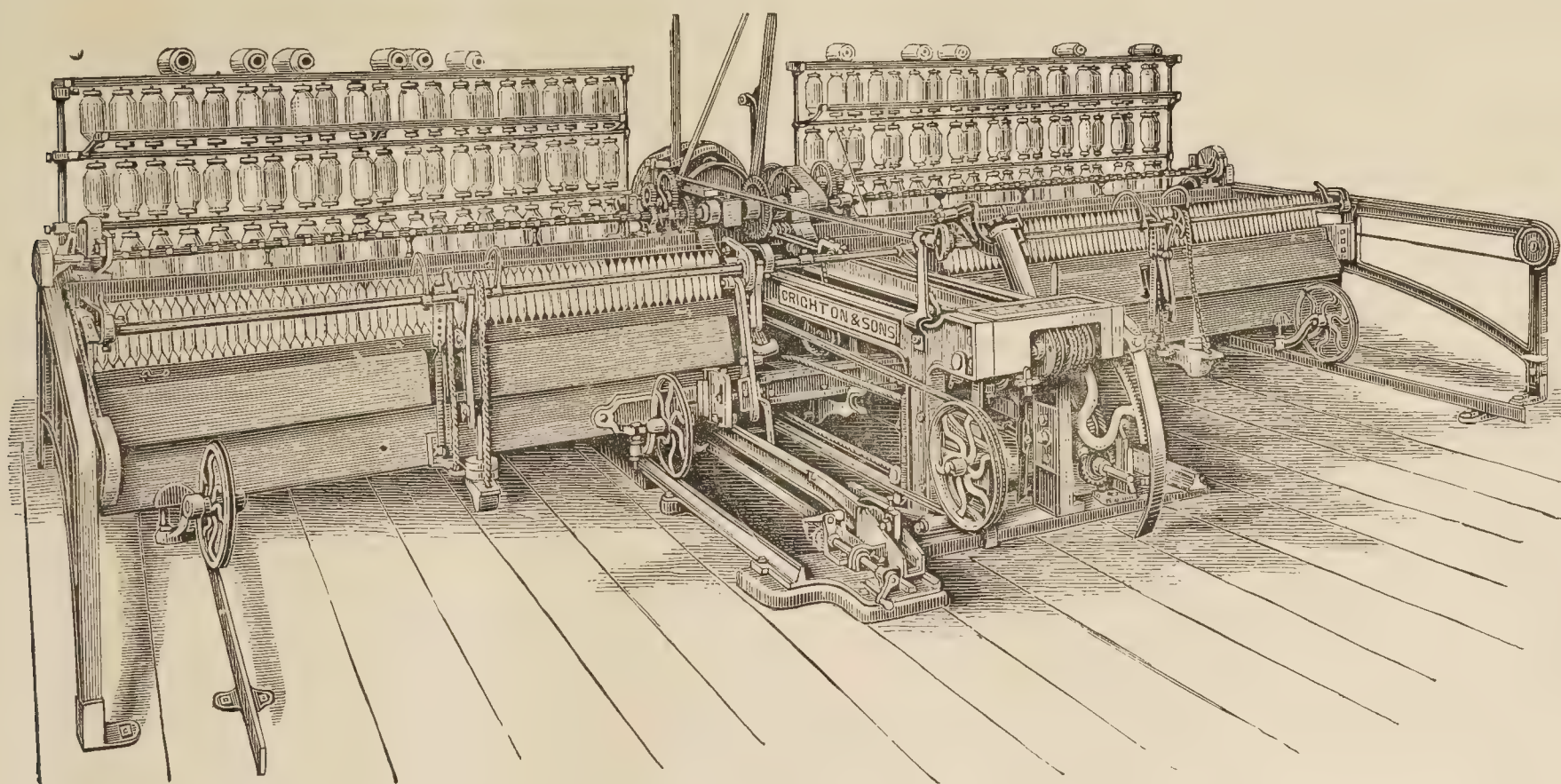


Fig. 3.

of the substantial manner in which it is constructed; and the careful arrangement of several details obviate defects observed in existing types of headstock. Referring to the engravings, it will be seen that, in its general lines, the headstock is on Parr's principle, with Platt's builder. The headstock frame is made heavier and stronger than usual: in fact, strong enough to resist the strains due to the working of the longest mules constructed at the present time. The foundation plates at back and front are about six feet long, and, as will be noticed, they carry the main slips and builder. This arrangement has met, and is now meeting, with great favour at the hands of spinners, the fixing of the builder on the foundation plates especially having much to recommend it. Besides being altogether a more mechanical job than the old method, it gives firmer winding, resulting, as a matter of course, in better cops. The foundation plate at the back also carries a bearing supporting the outside end of the taking-in scroll shaft, a plan not so widely adopted by mule makers as it deserves to be. Messrs. Crighton and Sons have a peculiar, but neat, way of tightening the taking-in scroll bands. Instead of each band being tightened separately, and naturally, in the ordinary course of things, unequally, the two bands are really made in one, the two ends being fixed to the scrolls, and the middle portion attached to the carriage in such a way that when the tightening motion is screwed up, the tension put upon the band is equal throughout; that is to say, what appears to be two bands, or what in reality are two halves of the same band, have equal work to do in drawing in the carriage, and not one more than the other, as would be the case were they unequally tightened. This improvement has considerable merit. A further departure from existing practice consists in making the drag or gain wheels in the mandoza of finer pitch than usual, making up the strength by using wider wheels. These wheels draw out the carriage, and the finer their pitch the more accurately can the drag or gain of the carriage be adjusted, always a matter of moment, whether the staple of the fibre

mixing machines for opening cotton from the bale; improved "Crighton" openers; patent combined "Crighton" opener and lap machines; lap machines with improved leaf extractors; Derby doublers; grinding machines for rollers with or without fan; grinding machines for flats and rollers; drawing frames; slubbing frames; intermediate frames; roving frames; improved self-acting mules adapted for all classes of work; also improved wool opening and cleaning machines for which they received the highest award (viz.:—silver medal) at the Bradford Exhibition of 1882; machines for cleaning and preparing silk noils for the carding engines; dandy silk frames and roving frames for merino and silk. A more comprehensive list of textile machinery emanating from one house could not be cited, and when we add that not only do Messrs. Crighton and Sons' machines display great inventive talent, but that they are all made of the best materials and by the most competent workmen, our readers may gather some idea of the extent to which this eminent and old established firm may be relied upon to supply all their requirements in the matter of such appliances as those referred to above. We would further especially point out to our readers that Messrs. Crighton and Sons have succeeded to the business of Messrs. W. Higgins and Sons, of Salford, in the making of their well known drawing, patent express slubbing, intermediate and roving frames, having purchased from that firm all the patents on these frames, for all countries (except the United States of America), and have, further, secured the services of Messrs. Higgins' late manager, Mr. E. Cutler, (who was in their employ for upwards of 35 years,) to superintend this department. Spinners, who have Messrs. Higgins' frames, the merit of which it is unnecessary to describe, further than to say that the swivel attachments, in connection with their peculiar arrangement of long collar, enable the frames to turn off the extraordinary weights for which they are so famed, will, we feel sure, be pleased to know that Messrs. Crighton and Sons can supply them with new frames as well as repairs to existing frames, made by Messrs. Higgins and Sons.

Dent's Registering Tell-Tale Clocks for Watchmen.

Many devices, all more or less perfect, have been in use for marking the periodical rounds of watchmen and firemen on duty. The one generally adopted, but now obsolete, was the peg tell-tale clock. As usually made, this consisted of an ordinary clock enclosed in a glass case, having, in addition to the hands to show the time, a disc which performed a revolution once in every twelve hours, around the edge of which, and radiating from it, were arranged a series of metal pins or pegs, each marking a space equal to a quarter of an hour. These pins, loosely fitted into holes drilled in the disc, were held in position by springs, and were capable of being pressed inwards towards its centre. A knob was provided outside the case, and by pressing upon this, the watchman drove in the pin which corresponded to the time at which he paid his visit. An inspection of the clock in the morning showed how the watchman had performed his work. Apart from its costliness, which was excessive, as a clock had to be fixed at every part of the building or works to be visited, this system had a further serious drawback. If

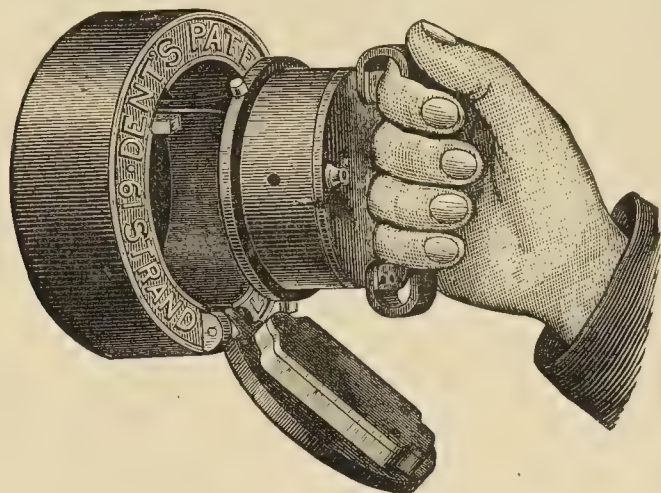


FIG. 1.—Showing Method of Using.

the watchman was delayed, as frequently happened, only a minute or two, he reached the spot when the pin had passed the push-piece, and unless he waited several minutes for the next pin to arrive in position, he could leave no record of his having been there at all. Dent's tell-tale has, however, very effectually overcome these objections. In this case, the watchman carries in his pocket, or in a leather sling pouch supplied for the purpose, a small clock, Fig. 1, which has a lever escapement, will go in any position, and is provided with a strong brass case with a leather handle. At each of the "points" of his rounds is fixed an inexpensive cast iron "type-box," which has within it a distinctive letter, figure, or design. All that is necessary for the watchman to do is to press his clock into this box, and the projecting type enters a slot in the face of the clock, and prints on a revolving paper dial within. This dial, which is shown by illustration 2, has printed on

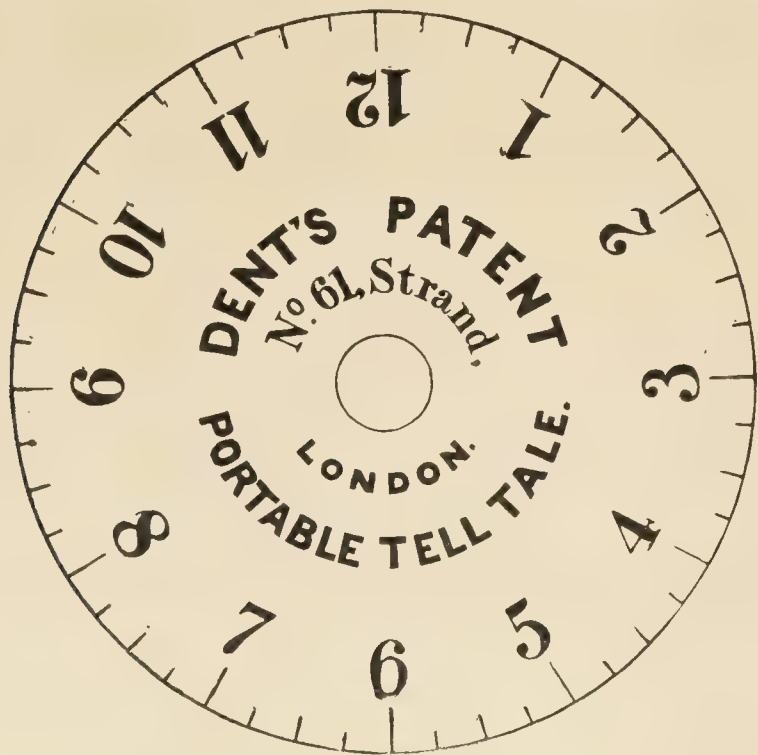


FIG. 2.—Paper Dial—Upper Side.

one side the hours and quarters for showing the time, and upon the other, Fig. 3, the hours are divided into quarters, and concentric circles are also provided. On this side of the dial, the printed impressions from the type are obtained by means of carbonic paper placed next to it, the same station always printing in the same circle, so that in the morning, or at the completion of the period of the watchman's duty, the supervisor may open the tell-tale, and, on removing the dial, he finds an exact record of the watchman's rounds. To prevent any possibility of being tampered with, the tell-tale is provided with a screw bolt and lever lock. A fresh dial is put on every day, and the used dials may be dated and filed in a tin box provided with them, or they may be pasted in a book, a custom which has been observed by some users, notably at the Empire Theatre, London, where the tell-tale has been adopted since its opening. The economy of this system is at once apparent, as only one portable clock (costing about

the same as each peg tell-tale) is required, and the type-boxes can be used almost without limit as to number. The watchman's visits are recorded whatever time he may do his work, and a lasting printed record is always at hand for reference. Messrs. E. Dent and Co., of 61, Strand, and 4, Royal Exchange, the manufacturers and patentees, inform us that there are now over 700 sets of their apparatus in use in all parts of the world. They have been largely adopted by the lunatic asylums, prisons, the principal public

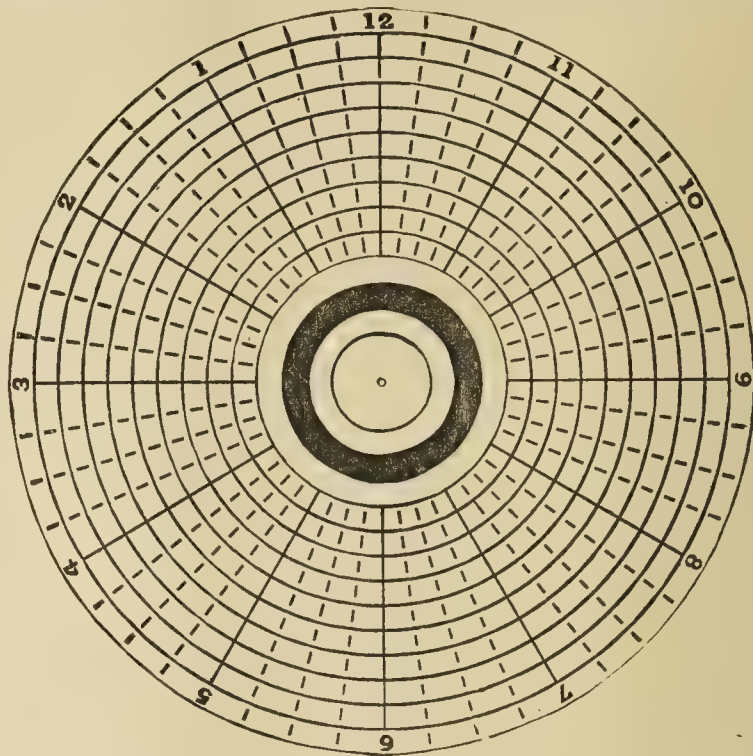


FIG. 3.—Paper Dial—Under Side.

buildings and institutions, throughout the United Kingdom, and by many private firms. Their utility is not, of course, confined to watchmen's duty. For manufacturing processes requiring special attention at stated times, these clocks have been used with great advantages, notably in the case of the indigo manufacture, where neglect at a certain critical period of its preparation is most injurious. The Indian planters have, by the adoption of this tell-tale, rendered any omission on the workman's part to attend to the vats immediately discoverable.

Jardine and Arthur's Patent Leather Belting.

In the fastening together of the ends of leather belting, there have been, during the past few years, several methods in vogue by different makers, each of which has had its advantages and disadvantages. A method of fastening the joints has recently been patented by Messrs. Jardine and Arthur, of Nottingham, the distinguishing feature of which is the making of a joint, as in Figs. 1 and 2, the fastening of which is accomplished by the use of cement alone. This manner of making a joint will undoubtedly add strength, ensure smoother running, and thus render the

Fig. 1.



Fig. 2.

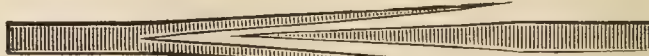


Fig. 3.

belt more durable than those jointed by the methods now in general use. It is well known that a riveted joint weakens the strength of the belt in a greater or lesser degree, according to the quality of the leather, and the same may be said of the sewn belts, as with the constant friction upon the riveted or sewn parts they give way, and, at the same time, if a riveted or sewn belt is not evenly made, it runs in a rather erratic and uneven manner. Fig. 3 shows a section of belt in which the joint is made in the usual manner. Fig. 2 shows the "splice" made for the patent joint, and Fig. 1 gives the same when finished. The fastening of the joint is effected by cement alone, no sewing or riveting being necessary. It will be seen that the joint, when neatly fastened, leaves no uneven surface on the belt, and, therefore, any undue friction by the pulley is entirely obviated. A much stronger, smoother, and more durable, belt is the result. Mr. John Jardine, of Nottingham, who is making the belting, will give further particulars on application.

Electric Lighting at Colne.

An installation of the electric light, on the incandescent system, has lately been fitted up at Messrs. N. Smallpage and Sons' works, Colne. The lights are supplied from a compound self-regulating dynamo machine, of the Ellwell-Parker improved type, driven direct by a Davey-Paxman horizontal fixed steam engine. The lamps are of the Edison-Swan pattern, and are of 16 and 25 candle power, distributed through the weaving sheds,

bleach and dye-houses, beaming room, offices, &c. Switches are provided to sections of the lights, which can be turned on or off as desired. All wires are of ample capacity to carry double the amount of current required, and are all encased in wood. The installation has been working for some time, and, so far, has proved everything that could be desired. The whole of the work was contracted for, and fitted up (according to insurance rules), by Mr. H. Bury, Electric Light Engineer, Manchester.

Rheea Fibre.

According to the *Indian Agriculturist*, Mr. Charles Maries, of the Durbhunga Raj, has solved the Rheea fibre problem, by having discovered a process by which the fibre can be desiccated in the green state with extraordinary facility, and afterwards worked up to the required standard. We have seen, says the paper above named, some of this fibre, and can state with certainty, that we have seldom seen Rheea fibre to equal Mr. Maries' specimens; it retains all its strength of tension, while the floss is as soft as silk. Mr. Maries has shown some of the fibre, treated by his newly discovered process, to some of the large Calcutta merchants who deal in fibres, and their opinion is highly favourable.

The "Pita" Fibre-Cleaning Machine.

Several influential gentlemen recently met in Barcelona to witness the working of a machine invented by Don Demetrio Prieto, a Spanish native, for extracting the textile fibre of the "Pita" or aloe. The leaves of the aloe as they were cut from the plant, without any preparation whatever, were made to enter the machine at one end, and to reappear at the opposite end freed of the article, pulp, and nearly dried of the liquid which moistens them. The experiments made were thoroughly satisfactory. This machine is the first one invented for the cheap production of the aloe fibre. The inventor claims that the "cleaner" will operate on about 1,500 lbs. of fibre a day. The plant, of which there are eight species known, grows chiefly in tropical and sub-tropical regions, and will thrive in almost any soil, and when it is once established, it is difficult to eradicate it. The invention, therefore, is of vast importance to the textile industry.

The Textile Industry.

Several new designs in broché patterns have appeared this week, our Leipzig correspondent says. These embrace principally flowers with the stalks attached. Bunches of grapes in relief on a heliotrope ground form a very pretty design. Stuffs with lace-lines in imitation of Soutache patterns are very pleasing. We have now woollen stuffs with broad velvet stripes, over which are drawn patterns in little bunches of flowers, carried out in machine embroidery, or interworked in the dark ground stuff as straw plaited designs. There is also a plum-blue cashmere striped by finger-broad contrasting lines, while between the stripes were strewn somewhat light coloured violets carried out in embroidery. Another cashmere was of a dark terra-cotta colour, showing interlaced flower designs between wine-red velvet stripes; this effect was very pretty. Our correspondent is of the opinion that manufacturers ought not to go in too much for checked patterns; he thinks a reaction against this class of designs will shortly set in. They might, with advantage take up the new pea patterns mentioned before. There has been, further, received from Lyons in the latter patterns some novelties in Bengalines and Ottomans. Amongst them there is a mahogany colour *faillie*, patterned by tobacco coloured circles the size of a sixpenny bit. Also noticeable were *merveilleux* in salad green colours, striped by small myrtle green lines ornamented with large dots of a similar or contrasting green. There are likewise copper colour *faillies* patterned by large white dots, the latter woven, not printed as in *foulards*. Attempts will probably be made to produce this pattern by embroidery; but it is thought very likely that the quaintness of the pattern would be injured if carried out that way. Preference is given to mantle stuffs having relief effects. Some really pretty patterns are to hand in this line. On combed yarn grounds, these relief effects are carried out in mohair, and form lace-lines, small stars, and zig-zag lines. These patterns are also applied to water-proofings. A novelty in the pea patterns is *satin merveilleux*, the designs being of the size of a two-shilling piece and carried out in plush. Particular notice should be taken of this pattern as it is excellently adapted for autumn materials, executed on either woollen or silken grounds. Some new shades have appeared for mono-coloured cloths, viz.—heliotrope, *reseda*, and various tones of blue. A few elegantly executed designs in *frisé* flower patterns can be

recommended as applications for stripes and set-off designs. A very pretty *broché* stuff is the Garriek, showing flower patterns relieved from broad satin stripes, and raised again by *moiré* lines. Three new colours have made their appearance, which, however, are more pleasing when assimilated than separate. They consist of a sealing-wax red, a light Turkey blue, and a kind of olive-green—*Kuhlow's Gazette*.



ODDS AND ENDS.

It has been decided to commemorate Her Majesty's Jubilee, in Keighley, by completing the Technical Institute.

* * * *

A Technical School is to be built in Stockport in commemoration of Her Majesty's Jubilee.

* * * *

Several Russian Consuls-General have been summoned to St. Petersburg, in order to report on the measures to be taken for promoting Russian trade with foreign countries.

* * * *

A telegram from Calcutta says the railway to Quetta *via* the Hurnai route has been completed, and that railway material for one hundred miles of line is being collected in the Pishin Valley.

* * * *

A new Customs tariff has just been drafted for Mexico, of a more liberal character than that previously existing. The duties on woollen cloths are reduced, and there are forty-two additions to the free list.

* * * *

A Hamburg commission house has placed with a Berlin firm, two large sample orders for jackets and cloaks, intended for shipment for Japan, on the account of a German firm in Tokyo, which firm thinking that the Japanese, as a body, will follow the example set them by the Court, and adopt European clothing, have decided to introduce German goods as an experiment, and, if possible, to establish them on a firm footing in the market.

* * * *

There is being held in Rome an exhibition of lace, tapestries, and woven tissues. The Pope has lent the Vatican collection of lace. We are told that this may fairly be described as the most rare and valuable gathering of laces in Europe, consisting of the finest specimens of almost all epochs, all countries, and all qualities of the choicest kinds. As need hardly be said, it is almost unknown, and has been seen by but few people. Amongst other historical objects of interest exhibited, a mantle has been contributed by Prince Charles Buonaparte, which had belonged to Napoleon 1st.

* * * *

The Journal of the Madrid Chamber of Commerce states that according to recent information, about twenty German houses now occupy themselves with the exports of African products from Tangiers, such as wax, native textiles, pharmaceutical extracts, wool, &c. More than fifty houses announce themselves as importers of German goods, such as toys, musical instruments, paper, colours, glass and surrogat de café. England, which has lost most ground by French competition, has now to stand the severe competition of German manufacturers in Morocco.

* * * *

A Cloth-workers' Industrial School is to be established, in the course of the present year, at Elbeuf, for the purpose of imparting sound professional instruction in the staple trade of the town. A building has already been selected. The Council General has voted 8,000f. per annum for the first five years, and the Government 1,000f. The Municipal Council, with the co-operation of the Société Industrielle at Elbeuf, has therefore decided to assume the direction of the undertaking, with the prospect of opening the first course of lectures and classes in October.

* * * *

We learn from Zurich that not fewer than 34,000 silk weavers are employed, at high wages, in the various factories of that city, business having been almost unprecedentedly brisk for several months past, and notably, since the beginning of February, large orders having come to hand from the United States and several French colonies, where German houses have hitherto exercised a predominating influence. The silk-throwers and ribbon-weavers are also fully engaged on important orders, and latest consular advices show that the present activity is likely to be continued for some months. About 400 additional power looms were introduced in 1886, and there appears to be a corresponding increase this year.



Receiving Orders.

Goulden, R., and James, J. H. (trading as the Seedley Printing Company), 22, Dickinson Street, Manchester, calico printers, Manchester Court.
Minton, H. A., and Minton, W. A. C. (trading as William A. C. Minton and Co.), 63, Piccadilly, Manchester, silk merchants, Manchester Court.

Dividends.

Lymbery, F., Willat's Factory, Regent Street, Long Eaton, Derbyshire, lace manufacturer, 5s. (first and final), Samuel P. Derbyshire, Chartered Accountant, Cobden Chambers, Pelham Street, Nottingham.
Marriott, F., Bradford Road, Birstall, Yorkshire, woollen manufacturer, 2s. 6d. (second). Offices of Armitage, Clough and Co., 23, John William Street, Huddersfield.

Dissolutions of Partnership.

Booth, T. W., and Cotton, W. T., 32, George Street, Manchester, calico printers, &c.
Calvert, J., Calvert, T., Garnett, W., Cold Edge Mills, Warley, near Halifax, Yorkshire, worsted spinners.
Fielding, C., Fielding, Joseph, and Fielding, James, Golcar, near Huddersfield, woollen manufacturers.
Hoyle, J. B., and Parker, J., Walker Lane, Hebden Bridge, Yorkshire, wholesale clothiers and fustian manufacturers.
Scattergood, A., and Staynes, J. R., High Pavement, Nottingham, lace manufacturers.

PATENTS.

Applications for Letters Patent.

Automatic "fly" catcher for carding engines. R. Wilson and J. Wood, London.	8th Mar.	3,524
Bobbins or beams for winding yarns and textures. T. Brown and W. Pickstone, London.	3rd Mar.	3,282
Boiling size in size boxes of sizing machines. Messrs. Pickup, Manchester.	10th Mar.	3,623
Belting. F. Gill and T. E. Robson, Sunderland.	15th Mar.	3,886
Brake wheel and loom side. J. Holden, Haslingden.	25th Mar.	4,444
Breaking and heckling flax, &c. W. Raux, London.	26th Mar.	4,524
Contrivance for preventing oil stains, applicable to looms for pile fabrics. W. Moscrop, Rochdale.	3rd Mar.	3,257
Covering rollers employed in cotton or other textile preparing machines. P. Bowden, Bolton.	9th Mar.	3,563
Combs, comb-bars and carriages for bobbin-net or twist-lace machines. E. Cope, Liverpool.	19th Mar.	4,158
Connecting tapes for driving spindles and appliance therefor. F. K. Adcock and A. Dracup, Bradford.	23rd Mar.	4,331
Cop weaving shuttles for jute, &c. D. McGregor, Dundee.	24th Mar.	4,395
Carding machines. J. Nasmith, Manchester.	28th Mar.	4,572
Combined sizing, drying and warping machines. E. Brooke and J. Vickerman, London.	28th Mar.	4,591
Dewing, spraying or damping woollen, &c., pieces. J. J. Ashworth, Rochdale.	28th Feb.	3,053
Driving belts. J. K. Tullis, Glasgow.	8th Mar.	3,513
Decorticating fibrous plants. H. H. Lake, London.	8th Mar.	3,548
Drying textile fabrics. W. M. Riddell, London.	10th Mar.	3,625
Dressing or separating and cleaning passava, &c. H. E. Ludbrook, London.	10th Mar.	3,680
Dyeing warp, &c., threads. J. Burn, Bradford.	12th Mar.	3,753
Dyeing black, blue, &c. Messrs. Chadwick, London.	26th Mar.	4,547
Facilitating the cutting of yarns into lengths, principally for Oriental rugs. H. Grafton, London.	2nd Mar.	3,217
Finishing cotton velvets and similar pile fabrics. R. S. Collinge and W. Edelston and Co., Manchester.	4th Mar.	3,307
Finishing and polishing certain textile fabrics. W. Baxter, Bradford.	10th Mar.	3,662
Gig machines. A. Monforts, London.	2nd Mar.	3,185
Indicator for flexible bends of carding engines. E. W. Wrigley and R. Patterson, Manchester.	26th Feb.	3,011
Imitation skin rugs. G. Ambler, Bradford.	25th Mar.	4,461
Jacquard machines for looms. A. Flather, Bradford.	5th Mar.	3,368
Jacquard needles or cross wires, and parts connected therewith. J. Jardine and C. H. Crawley, London.	24th Mar.	4,419
Looms for chenille or fur pile fabrics. D. Barbour, J. Christie and M. Corrigan, Glasgow.	25th Feb.	2,932
Lags and pegs of dobby or shedding apparatus. T. Stone and J. Burnett, London.	25th Feb.	2,970
Lubricant. A. G. Wass, London.	26th Feb.	3,030
Lubricators. E. Tate and S. Smirke, London.	28th Feb.	3,106
Lubricators for use with viscous or solid lubricants. W. S. Chantrell, Liverpool.	7th Mar.	3,452

Looms for tubular fabrics, covering electrical cables, &c. T. C. Barraclough, London.	8th Mar.	3,525
Lubricating a number of bearings. T. W. Durham and T. H. Shaw, London.	15th Mar.	3,923
Looms. M. E. Crompton and H. Wyman, London.	17th Mar.	4,051
Lace and similar fabrics. E. Cope, Liverpool.	19th Mar.	4,157
Looms for splitting fustians, &c. J. Rayner, J. Hilton and H. and W. H. Eckersley, London.	22nd Mar.	4,272
Looms for Turkey or looped towels. A. Lister and W. Carter, Halifax.	25th Mar.	4,454
Mounted wire or metal healds and heald shafts. H. B. and A. B. Barlow, Manchester.	5th Mar.	3,374
Measuring, marking, packing cloth, &c. H. H. Lake, London.	15th Mar.	3,924
Machine for folding fabrics. C. King and S. Oldershaw, Leicester.	17th Mar.	4,014
Manufacturing yarns. T. H. Blamires, Huddersfield.	28th Mar.	4,580
Noble's combing machine. J. Pickles and H. W. Whitehead, London.	10th Mar.	3,665
Opening and cleaning cotton, &c. Messrs. Greenhalgh, Manchester.	4th Mar.	3,306
Oiling rags whilst being fed to machine. C. Wilcock, London.	10th Mar.	3,645
Operating trap levers of twisting frames. Prince Smith, London.	11th Mar.	3,692
Opening, spreading, and detaining the twist in fabrics, in bleaching, dyeing, and finishing. R. R. Roberts, London.	19th Mar.	4,172
Pickers and picking sticks. D. Thornton, Halifax.	25th Feb.	2,916
Pulleys and drums. R. R. Gubbins, London.	10th Mar.	3,620
Pickers for looms. Messrs. Ingham and Morton, Bradford.	10th Mar.	3,642
Picker. R. Ashworth, Preston.	11th Mar.	3,693
Preventing snarling during winding and reeling cotton, and other yarns, either single or double yarns, from headed bobbins, ring frame bobbins, spools, tubes, and mule or twiner cops. J. and W. Schofield, Oldham.	14th Mar.	3,807
Picking sticks. C. B. Brook and J. Clough, Bradford.	15th Mar.	3,883
Pickers and picker connectors and apparatus therefor. J. Dawson and H. Armistead, Blackburn.	16th Mar.	3,967
Patent brake for saving rim-bands. R. Winckley, Accrington.	28th Mar.	4,565
Printing and finishing cotton fabrics. T. Hardcastle, Manchester.	28th Mar.	4,579
Quilts. J. Davis, London.	15th Mar.	3,897
Raising or producing nap on textiles. J. Hardy, Bradford.	2nd Mar.	3,181
Reps for upholstery purposes. G. P. Lee, Manchester.	2nd Mar.	3,196
Rollers for dyeing, washing, soaping, and bleaching. A. Birch, Manchester.	9th Mar.	3,561
Stop motions for looms. H. Butler, London.	10th Mar.	3,633
Self-acting twisted healds for mails, and noosed healds in single or double knots. J. Appleyard, Bradford.	10th Mar.	3,639
Steam presses for finishing lace goods. C. J. Cox, London.	10th Mar.	3,679
Steeping flax, &c. P. Parsy, London.	11th Mar.	3,719
Spinning machines for ramie fibres. T. E. Schiefner, London.	14th Mar.	3,866
Scutching machines for flax. J. B. Black, Ballymena.	22nd Mar.	4,282
Stop-motion for shuttle boxes of drop-box looms. J. Haydock and W. Rosseter, London.	24th Mar.	4,412
Shedding motions. R. Bulcock, London.	25th Mar.	4,451
Spinning fibres and twisting yarns. J. A. Leeming, Halifax.	26th Mar.	4,501
Scolloping lace. T. Foster, Farnsfield.	28th Mar.	4,570
Testing the strength of yarn or thread. J. Berkeley, Belfast.	28th Feb.	3,054
Treating fibrous materials and fabrics for bleaching, dyeing, &c. W. Walker and J. Drenchfield, London.	8th Mar.	3,541
Taking-up motions. J. Cowburn and C. Peck, Manchester.	18th Mar.	4,117
Velvets and velveteens. J. Cook, Manchester.	11th Mar.	3,702
Wet counter for looms, called "Rigg Wetometer." W. Rigg, Bradford.	25th Feb.	2,980
Winding yarn. J. W. Makant and P. Parkinson, London.	28th Feb.	3,076
Winding the yarn on spindles, on mules and twiners, &c. J. C. Schofield, Elland.	19th Mar.	4,156
Warping and beaming. H. Ainley and J. Hollingworth, Halifax.	23rd Mar.	4,344
Washing, bleaching, dyeing. E. and G. E. Sutcliffe, Manchester.	26th Mar.	4,509

Patents Sealed.

2,362	2,420	2,782	12,231	13,668	14,213	15,003	2,366
2,417	2,443	2,621	2,744	2,091	3,980	15,154	16,101
67	1,205	1,388	1,397	1,627	2,561	2,819	2,851
2,939	12,206	15,437	15,578	15,619	15,635	15,669	243
2,943	2,954	3,065	14,737	15,034	284	3,178	3,755
10,602	1,834	3,212	3,246	3,333	3,361	3,427	3,450
3,474	3,562	3,640	5,052	7,210	14,117	15,468	1,693
2,941	3,486	2,434	2,454	3,062	3,279	3,662	3,707
3,795	5,639	14,367	16,623				

The Journal of Fabrics

AND

Textile Industries.

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Notices.

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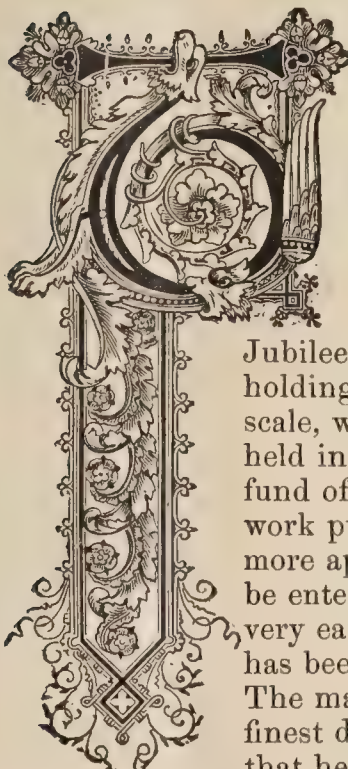
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Readers are invited to forward items of interest to the Trades concerned.

The Proprietors will feel greatly obliged if any of their readers, in making enquiries of, or opening accounts with, Advertisers in this paper, will kindly mention the *Journal of Fabrics and Textile Industries* as the source from whence they obtained their information.



Manchester Jubilee Exhibition.



THE Manchester Jubilee Exhibition, recently opened by H. R. H. the Prince of Wales, will prove the most attractive show that has ever been held in the provinces. The buildings which have been erected are handsome and commodious, and have quite the appearance of a permanent structure. No better mode of commemorating the Queen's

Jubilee could have been conceived than that of holding, in Manchester, an exhibition on a large scale, which scheme was adopted at a meeting held in the Town Hall last June. A guarantee fund of over £130,000 was soon raised, and the work pushed on to a satisfactory issue. Many more applications for space than could possibly be entertained were received by the Committee very early, and, therefore, a judicious allotment has been made so as to secure the best exhibits. The machinery section may be described as the finest display yet seen, being decidedly ahead of that held in Paris in 1878, in fact, those who

have visited many of the International Exhibitions held during past years, so far as the machinery is concerned, pronounce decidedly in favour of Manchester. We have endeavoured to

give a short account of this and other sections, but our space being limited, we have been obliged to omit the mention of many very valuable and interesting exhibits. We shall, however, enter more fully into the subject in our June number.

MACHINERY.

Messrs. HICK, HARGREAVES AND CO., of Bolton, supply a horizontal Corliss engine for the motive power at the exhibition. It has a cylinder 18 in. diameter and a stroke of 4 ft. The cylinder is built upon a plan introduced by this firm, with a separate liner, separate steam jacket casing, and separate end valve chests. The valve gear, which is of steel, is of the Inglis and Spencer type, with double wrist plates actuating the steam and exhaust valves independently. There are various other improvements in the engine, which is identical with that at the Yorkshire Exhibition at Saltaire.

Messrs. JOHN MUSGRAVE AND SONS, LIMITED, Globe Iron Works, Bolton, Lancashire, show a horizontal compound steam engine, 4 ft. stroke, high-pressure cylinder, 21 in. diameter, low-pressure cylinder, 37 in. diameter, fitted with Musgraves' patent traversing Corliss valves, automatic slip-motion and quick-speed governor; fly rope drum between cylinders 20 ft. diameter, grooved for 15 $\frac{1}{2}$ in. ropes; Whitworth hollow-compressed fluid steel crank shaft and crank pin—this engine is prepared for the application of condensing apparatus—turning or barring engine, with Musgraves' patent automatic safety apparatus; duplicate turning or barring engine, with Musgraves' patent automatic safety apparatus.

Messrs. W. AND J. GALLOWAY, Knott Mill Iron Works, Manchester, have supplied the boilers for running the machinery, consisting of ten Galloway boilers of 400 horse power each, these being 30 feet long by 8 feet wide. The boilers are entirely constructed of selected steel plates, and are made suitable for an ordinary working pressure of 100 lbs. to the square inch. When it is mentioned that these boilers will evaporate 80,000 lb. of water per hour, it will be seen that with ordinary condensing engines they are capable of providing sufficient steam for upwards of 4,000 indicated H.P. Messrs. Galloway have also fitted up the whole of the steam and exhaust piping throughout the Machinery-in-Motion department in the Exhibition, leading the steam to the various engines in the dynamo-house, and also the four large engines in the machinery annexe, and further, the exhaust steam from these various engines back to the main chimney, into which it is all conveyed. Altogether, in the Exhibition, Messrs. Galloway supply over 200 tons of pipes. They have also carried out the whole of the contract in connection with the illuminated fountains.

Messrs. CRIGHTON AND SONS, of Castlefield Iron Works, Manchester, have an interesting exhibit, consisting of Higgins' patent express frame. Since they undertook the manufacture of these frames, they have executed numerous orders for them in all sizes, from 5 in. to 12 in. inclusive, both right and left hand, for cotton, merino, or silk. A valuable improvement to this machine is the patent diagonal shaft driving arrangement, which dispenses with the swing wheels, and is a most perfect winding-on motion. It gives much more regular winding than usual, with fewer thin places in the sliver, and prevents irregular tension between the front roller and the top of the flyer. As in the Rabbeth spinning spindle, the spindle and bolster in this are self contained, and the spindle can be drawn out at will, there being no set screw to the pinion, thus affording extra facilities for changing wheels, cleaning, oiling, &c., and as the bobbin moves up and down outside the bearing—the bearing being fixed—and the spindle revolves free in its bearing, there is an impossibility of any binding of the spindle in the bolster support, thus enabling the greatest possible speed of the spindle to be obtained. As we shall, no doubt, have a lengthy descriptive notice of this firm's exhibit in our June Exhibition Number, we will leave the matter with these few remarks.

Messrs. EDWARD GREEN AND SON, 14, At. Ann's Square, Manchester; works, Wakefield, exhibit their patent fuel economisers, fitted with dentilated scrapers and access pipes, various sizes; fuel economiser for single boilers, with cold-drawn seamless steel tubes; specimen castings of parts of economiser, all pipes being cast vertically in dry-sand moulds; fuel economiser of 192 heating pipes, in operation to the working boilers. Further reference to this firm is made in the notice of the Yorkshire Exhibition at Saltaire.

THE ROSSENDALE BELTING CO.—The difficulty experienced, and the expense incurred, in obtaining good leather for machine driving have been the means of bringing forward many substitutes, such as stout canvas, folded, and firmly stitched, cotton and linen woven in a solid form, canvas covered with india-rubber, and numerous others, but none were found satisfactory, owing to their propensity to stretch, and to their being rapidly worn away when brought into contact with a strap fork. A strong hair was fixed upon, and, after some little time, it was found that it could be woven into a belt, so as to answer the purpose admirably, combining, as it did, strength, durability, little or no stretch, and, what was of very great importance, a very superior biting power on the drums and pulleys, thereby producing the greatest possible amount of work. But this belting was found not to be faultless, when used with a strap fork, and it is to the Rossendale Belting Co. that the credit is due of having brought forward their patent anti-friction edge, which enables the belt to resist positively the action of the strap fork, and which does away with what has hitherto been the great objection to all woven belting—frayed edges. This belting, in a little over two years, has made great headway, and is now largely in use in England, on the Continent, and even in India and Australia. It has proved, in the case of the old saying, "there is nothing like leather," that there is no rule without an exception. The Rossendale Belting Co., by means of powerful looms, can make these belts from 1 to 40 inches wide, and although only about half-an-inch thick, a 36-inch belt is now transmitting 1,000 H.P. The patent anti-friction edge

has also been adapted by this Company to cotton belting, which, besides enabling it to resist the action of the strap fork, also renders it less liable to stretch. The hair belts made by the Rossendale Belting Co. have been found admirably adapted for driving dynamos, and are now driving all the machinery of the Anglo-American Brush Electric Lighting Company at the Royal Manchester Exhibition, which is the largest installation in the world.

Messrs. MATTHEWS AND YATES, 35, Lever Street, Manchester, show the Crossley air propeller for ventilating, cooling and drying purposes. They also show a propeller with their patent self-closing doors, which shut off all draughts when the propeller ceases working. This is a feature which will be greatly appreciated by those who work under a propeller. They also show a humidifier for moistening the atmosphere. A similar exhibit is to be seen at Saltaire Exhibition.

CHATWOOD'S PATENT SAFE AND LOCK COMPANY, LIMITED, contribute about 30 tons of their invincible fire, fall, and burglar proof safes, comprising a large assortment of their manufactures in this line, from the tiny jewel safe to the massive steel bank strong room, weighing about 10 tons. One of the features at Chatwood's stand is the exhibition of the celebrated "Alexandria" safe made by this firm, which, at the great conflagration there, was exposed to intense heat for a fortnight, and after being dug out of the hot ruins resisted the efforts of a gang of engineers who for four days endeavoured to break it open, and was at last opened with its own keys, when its contents to the value of £250,000 were found preserved. This safe, having been fitted with new locks and having had its fire-proof chambers re-charged with composition, is to all intents and purposes as good as it was when first made. In addition to the safes that this firm have on view, they contribute also a complete assortment of their invincible locks, not only as used by them in the manufacture of their safes, but as adapted for all other purposes. At the second stand, also in the machinery annexe, will be found a collection of models of Chatwood's hydraulic balance applied to the bankers' strong room, passenger elevator, and jewellers' window lift, all of which are special features. Mr. Arthur Brunel Chatwood exhibits in the Grand Nave, near the great organ, models illustrative of his electro-pneumatic organ action.

Messrs. FRANK PEARN AND CO., Engineers, West Gorton, Manchester, have a good exhibit, consisting of a patent quadruple-acting pump, with two rams, each 10 inch diameter, two steam cylinders, each 12 inch diameter, stroke 9 inch. Double-acting pump, with one ram 6 inch diameter, one steam cylinder 10 inch diameter, stroke 8 inch. Long stroke double ram Manchester pumping engine, rams 4 inch diameter, steam cylinders 6½ inch, stroke 8 inch. Long stroke quadruple-acting Manchester air compressor or vacuum pump, with two air cylinders 8 inch diameter, two steam cylinders 8 inch diameter, stroke 12 inch. Single-acting Manchester donkey or wall pumps, rams 5 inch diameter, steam cylinders 1¾ inch diameter, stroke 1 inch. Single-acting Manchester donkey or wall pumps, rams 2 inch diameter, steam cylinders 4 inch diameter, stroke 4 inch. Double-acting Manchester donkey or wall pumps, pumps 2 inch diameter, steam cylinders 4 inch diameter, stroke 4 inch.

Messrs. DEVOGE AND CO., 15A, York Street, and 462, Oldham Road, Manchester, have a very interesting stand at which may be seen a loom, weaving 30in. cloth at the rate of 180 to 200 picks per minute, fitted with a 400's double lift double cylinder jacquard, which can be altered when required, to weave as a compound jacquard for cross-border work; a 400's double lift single cylinder jacquard, for working at the rate of 160 to 180 picks per minute; 600's single lift jacquard, with swing batten motion, for weaving about 120 pick per minute; a 400's single lift jacquard, with horizontal, or slide motion, for use in sheds with insufficient height for the swing motion; an 812's fine gauge jacquard machine, for use in lace manufacturing; and a 1200's Devoge's improved rising and falling, or double shed jacquard, for weaving heavy goods requiring a deep shed. Samples of couplings, lingoes, mails, &c., requisite for harnessing jacquard machines.

Messrs. EDWARD RENSHAW AND CO., 19, Corporation Street, Manchester, show an exhaust fan, and a fan with engine attached. This fan is of the wing disc order, and is specially useful for removing vapour, steam, dust, and for generally ventilating, cooling, drying, etc.

Mr. WM. BIRCH, Milton Street Works, Lower Broughton, Manchester, a maker of many improved and patented machines for bleachers, calico printers, dyers and finishers, has a very interesting stand, to which visitors should give a little time. Special attention should be paid to his patent conical and differential expanding or stretching rollers. The exhibitor has had a wide experience in this class of machinery, the outcome of which is the patent under notice, which is considered to be the simplest, lightest, cleanest and most durable yet introduced, whilst the cost is greatly reduced. The patent guide and scutcher are machines that Mr. Birch has perfected. They perform the work formerly done by children or men, in taking the twist out of the cloth when passing to a drying or other machine, and in opening, guiding, and spreading it, far more efficiently and cheaply than can be done by manual labour. At the same time, they are abolishing an unhealthy occupation carried on by young people perched close to the ceiling, where heat and vapours congregate. The scutcher is fixed in the line of the cloth at a suitable distance from a pot-eye or guide roller, so that the beaters revolving in the opposite direction to the cloth may beat back the twist freely. From the beaters, the cloth runs over spiral rollers to be spread out, and thence to the angular guide or spreader below, which immediately adjoins the drying or other machine. The guide is fitted with automatic angular rollers for guiding centrally, and opening out crimps and creases of fabrics after the twist has been taken off the cloth by the scutcher. The guide dispenses altogether with the necessity of an attendant, where one has previously been needed to guide the fabric in the desired track. This machine acts with perfect accuracy, and delivers any class of fabric com-

pletely free from crimps or creases of any kind. The rollers can be attached to, or placed in, any kind or class of machinery for the purpose of guiding and straightening the fabric for calico printers, dyers, finishers, calenderers, &c. The inventor is prepared to supply machines on approval, removing them at his own cost if they fail to give satisfaction. Patent squeezers and rotary sewing machines are largely made by this exhibitor.

Messrs. GEORGE THOMAS AND CO., 28, Deansgate, Manchester, who are contractors for all kinds of textile machinery, show a double-gear universal milling machine, with three-speed cone, making six changes of speed. The spindle will carry arbor projecting 20 inch. The spiral bed can be set at angles of 35° each way, from centre line of spindle, and fed automatically 16 inch, taking also 16 inch between centres, and will swing 11 inch. Horizontal movement of spiral clamp bed 6½ inch, and the vertical movement below spindle centres is 10 inch. Fitted up complete.

Mr. H. BURY, 27, Arcade Chambers, St. Mary's Gate, Manchester, has a very interesting exhibit, consisting of general electric lighting plant, telephones and electrical pulleys. He also shows wrought iron split pulleys.

Mr. WILLIAM CROSSLEY, Chapel Works, Wrigley Head, Failsworth, near Manchester, exhibits a power loom, weaving silk handkerchiefs with cross borders, by the aid of one of his double lift jacquard machines.

Mr. WILLIAM RYDER, Bee Hive Works, Folds Road, Bolton, shows a gravity spinning spindle, in ring spinning frame of 48 spindles, running at high speed, and a gravity doubling spindle, in ring doubling frame of 36 spindles, for fine and coarse doubling at high speeds. Samples of fluted rollers, plain and fluted top rollers, slubbing and roving spindles and flyers, ring spinning and doubling spindles, mule spindles, &c.

The ALLEN MACHINE COMPANY, Halifax, exhibit specimens of their new patent label gumming machine, which is destined to supply a long felt want. There is not a single industry, nor even a branch of an industry, in which this machine will not be most useful. There is also on view a patent combined gumming and labelling machine, which can be easily adapted for labelling any kind of bottles, boxes or packages. This machine may be seen working. Samples of gumoline are also shown.

The MODEL PRINTING PRESS CO., 3, Ludgate Circus Buildings, London, E.C., have several of their specialities in machinery on view at Stand 455. This Firm are makers of cloth pattern cutting machines, which effect a great saving in labour, as fully two or three inches of cloth can be compressed and evenly and quickly cut by the aid of these machines. They are also makers of vertical and diagonal cutters for cloth and other materials.

Messrs. WILLIAM DICKINSON AND SONS, Blackburn, show Jucker's patent loom for weaving pile fabrics, two pieces face to face, or two pieces of plain cloth or ordinary plain cloth, a loom for weaving plain calicoes, another for checks, and one for heavy goods, each of which has special patented features. They also show winding and warping machines, and a slasher sizing machine; also shuttles, bobbins, pickers, and general sundries for weaving machinery.

Mr. JOHN TATHAM, Rochdale, shows a bare spindle cop spinning frame, which produces cops like the mule, and on the bare spindle; bare spindle cop and spinning frame for worsted, for producing cops like those hitherto only spun on a mule; a cotton and cotton waste carding engine, an automatic self-feeding weighing machine attached to carding engine, and a self-charging can coiling motion.

Messrs. IRVIN AND SELLERS, Preston and Liverpool, show bobbins and shuttles used in spinning and manufacturing cotton, flax, silk and wool; hardwood turnery used by electric light and bell manufacturers; specimens of American sawn woods and foreign hardwood logs used in the manufacture of the above.

Messrs. LAYCOCK AND SONS, Keighley, show main driving belts, single leather belting, link leather belting, pliable leather belting, and various kinds of machinery leathers. This firm has also a good exhibit at Saltaire Exhibition.

Messrs. PLATT BROS., Oldham, show machinery for which they have a world wide reputation. They have also machinery at Saltaire, which we mention in our notice of that Exhibition.

The MANCHESTER AND DISTRICT EDISON ELECTRIC LIGHT CO., LIMITED, 12, Victoria Buildings, and 7, St. Mary's Gate, Manchester, exhibit at Stand No. 1,347, a complete installation, showing application of electricity to lighting rooms, including about 70 Edison-Swan incandescent lamps. There is also an Otto gas-engine for working the installation. We are in possession of a full description of this exhibit, which we will refer to in our June number.

Messrs. J. E. H. ANDREWS AND CO., LIMITED, Reddish, near Stockport, have a large space in which they exhibit their Stockport patent silent gas engines in various sizes, and all of the horizontal pattern. They have also on view a quarter horse power Bisschop patent gas engine of a vertical type.

Messrs. JOHN DUGDALE AND SONS, Soho Foundry, Blackburn, exhibit a winding machine, arranged for cops, ring throstle, and hank yarns; beam warping machine, with automatic stopping motion; sizing machine (slasher system), with new improvements; a seamless bag loom, Laird and Rutherford's new improved system; a loom with Haythornthwaite's new brake; also a winding-on motion for roving and other frames, Dugdale and Davies' new system.

Messrs. JOHN SWAILES AND CO., Moorhey, Oldham, show paper and other tubes used in textile manufacture, and patent apparatus for placing them upon the spindles of all kinds of spinning and doubling machinery.

Mr. SAMUEL BROOKS, Union Iron Works, West Gorton, Manchester, shows his renowned spinning machinery, which visitors will do well to examine. The Stand is No. 443, Machinery Annexe Central, and the exhibit is most complete, including a variety of patented and improved machinery.

Messrs. ARTHUR LOWCOCK, LIMITED, Shrewsbury and Manchester, exhibit one of their well known patent fuel economisers for utilizing waste heat from steam boilers. We shall have something to say of this apparatus later on.

Messrs. DOBSON AND BARLOW, Bolton, have a stand in which two complete systems of preparing and spinning machinery are shown. There are in all seventeen machines. The first in order is a double cotton opener, with many improvements, two "Simplex" revolving flat carding engines, also with many improvements, a sliver lap machine, a combing machine, a drawing frame, a slubbing frame, an intermediate frame, two self-acting mules, a ring and traveller throstle frame, two ring doubling frames, a patent quick traverse drum winding machine, and a patent stop-motion reel for cops or bobbins. When it is considered that the whole of these machines are to be seen working, it will be readily understood what an important feature in this Exhibition is the display made by this well known Firm.

Mr. JOSEPH STUBBS, Mill Street, Ancoats, Manchester, has a stand in which he makes an effective display of his special machinery.

Messrs. ASA LEES AND CO., LIMITED, Oldham, occupy a large space, in which they exhibit cotton spinning and preparing machinery. As this firm is so well known, there is no need to say anything in reference to the machinery, we will, therefore, only enumerate the machines on view. There are a single lap machine, a single carding engine, a drawing frame, a slubbing frame, an intermediate frame, a roving frame, a twist ring spinning frame, a weft ring spinning frame, a patent self-acting mule, a patent self-acting twiner. In cotton waste machinery, they show a breaker carding engine, a finisher carding engine, a patent self-acting mule for spinning cotton waste on the woollen system, a patent condenser, and a single grinding machine; quite a large spinning factory in itself.

Messrs. JOHN INGHAM AND SONS, Croft Head Works, Thornton, near Bradford, show shuttles and pickers for the weaving of worsteds, cottons, silks, alpacas, mohairs, ribbons, flax, linens, carpets, woollens, worsteds, coatings, blankets, fustians, lastings, damasks, moreens, &c., &c.; also shuttle pikes for spools, pirns, and cops. A case almost identical with this one is on view at the Yorkshire Exhibition at Saltaire.

Messrs. THOMAS BROADBENT AND SONS, Central Iron Works, Huddersfield, show their hydro-extractors, which require neither gearing, belts, nor counter shafting, and dispense with foundations. This exhibit is well worthy the attention of those interested in such appliances.

Messrs. WATSON, LAIDLAW AND CO., Kingston, Glasgow, have a stand on which they exhibit various mechanisms of a high order, interesting to textile manufacturers, and which we may describe in a subsequent issue of this Journal.

Messrs. MATHER AND PLATT, Salford, have supplied a complete electric lighting plant for the Fine Art section, and, what will be to thousands of visitors an object of great interest, a ten cylinder calico printing machine in operation. Their stand is No. 384, section 2, machinery annexe.

Messrs. WALTER T. GLOVER AND CO., Salford, Manchester, exhibit examples of wire and cable variously insulated for general electric lighting purposes. Concentric cables for electric lighting on board ship and for use with secondary generators or transformers. Multiple cables for secondary generators or transformers. Non-inflammable and other flexible cords for electric lamps. Examples of joints for electric light cables. Examples of the whole of the wire and cable used in the fine arts and Old Manchester and Salford sections of the present Exhibition. Examples of the wire and cable used in private house installations, supplied for the Jubilee House in the Botanical Gardens. Patent telephone cables for preventing induction, also examples of the progress made in the manufacture of anti-induction telephone cables. Telephone wire of all classes. Patent wire gauge, gives five direct readings on every wire measured, viz., legal number, diameter in inch, diameter in millimetre, square inch area, and carrying capacity in amperes.

There are numerous exhibitors of belting, shuttles, pulleys and mill supplies, amongst which are—Belting:—Messrs. F. Reddaway and Co., Pendleton, Manchester; the Gandy Belt Co., Limited, Liverpool; Messrs. John Tullis and Sons, Glasgow; and Messrs. J. Ormerod and Sons, Castleton, near Manchester. Pulleys:—Messrs. Perkins, Son, and Barrett, Bradford; the Unbreakable Pulley Co., Ogden Street, Ardwick, Manchester; the Patent Power Pulley Co., Manchester. Shuttles, bobbins, etc.:—Messrs. Wilson and Co., Barnsley; Messrs. J. Dixon and Sons, Steeton, via Leeds; and Messrs. Wilson Bros., Todmorden. There are exhibitors of safes, amongst whom are Milners' Safe Co., Manchester; Messrs. George Price's Safe, Lock, and Engineering Co., Wolverhampton; Messrs. Chubb and Sons, Lock and Safe Co., Wolverhampton and Manchester; and Mr. John Port, Mill Street, Ancoats, Manchester. There is an endless variety of exhibits, many of special interest to textile manufacturers, but our space is limited, and notices of others must, therefore, be deferred.

YARNS, FABRICS, &c.

The exhibits of raw fibres, yarns and fabrics, in their different stages of manufacture, embrace nearly every description of material utilized for wearing apparel and general use. A number of the leading firms in Lancashire show in various forms, but, as our space is limited, we cannot particularise the different exhibits, so must content ourselves with giving a few. Mr. Isaac Bury, Adelphi Works, Salford, has an excellent show of bleached, dyed, and embossed calicoes, embossed prints, and velvets. Messrs. William Holt and Sons, Walshaw, near Bury, who are well known as makers of quilts, toilet covers, and such like goods, excel themselves in quilts, including honey-comb, Grecian, coloured alhambra, &c., and have a choice selection of toilet covers, &c. Messrs. John Haslam and Co., Manchester, show cotton in different stages of manufacture, and supplement it with a large assortment of fabrics, such as muslins, cambrics, lawns, brocades, checks, cotton dress goods, sateens, cashmeres, shirtings, &c. Messrs. J. Johnson, Son, Allsop and Co., Manchester, have toilet, honey comb, and alhambra quilts, toilet covers, Turkish and other towellings, table covers, damasks, &c. Messrs. Barlow and Jones, Limited, Manchester, also show the same class of goods, and, in addition, tapestry table covers, satin toilet covers, printed and embroidered vestings, swansdowns, canvas, and angola for embroidery, fleece door mats and hearth rugs. Messrs. Tootal, Broadhurst, Lee and Co., Manchester, have plain and fancy muslins and dress goods, shirtings, all silk and mixed silk, wool and cotton dress goods, printed calicoes, and muslins, velveteens, yarns and sewing cottons. Messrs. R. Fielding and Son, Sycamore Street, Manchester, have a large design of a figured silk handkerchief, for weaving portraits of Her Majesty, Queen Victoria, and other portraits, and illustrations of various incidents which have occurred during the Queen's lifetime. A handkerchief woven from the above design is also exhibited, and can be seen weaving in the loom of the Bradford Manufacturing Co., in the Machinery Annexe East, Stand No. 389; two designs for silk dress cloths, with samples of silk cloths woven from them; design for cotton dress fabric, with sample of cloth woven from it. This design can be seen weaving in the loom of Devoge and Co., jacquard machinists, Stand No. 372, in Machinery Annexe East. Sketches for various styles of cloth, in which the design is to be woven by the jacquard machine. The Rossendale Printing Co. show printed cretonnes in reps, sateens, crêpes, twills, &c., printed calicoes of various kinds, printed fancy cloths for dresses. Messrs. S. Schwabe and Co., Manchester, have a large selection of printed cottons, &c., and Messrs. F. Steiner and Co., of Church, show Turkey red goods, yarns and prints, and calico prints generally. Messrs. Simpson and Godlee, Swinton, exhibit damasks, dimities, cretonnes, and Turkey red twills. In the machinery section will be found some cases of fabrics, the most notable contents of which are the new patent Electric Velvets for Mantles, and other purposes, for ladies' wear, and also for shooting or riding suits for gentlemen. This velvet is made in almost any ground colour, and is then, by means of a special process, sprinkled or dotted with a lighter shade of the same colour. The marking is irregular, and perhaps resembles, more than anything else, the marking of a bird's egg. The fabrics are novel and pleasing, and will, no doubt, before long become popular. Other fabrics are shown, such as fancy and printed sateens, silk and mohair linings, plain and corded velveteens for mantles, and other purposes, plain and printed corduroys, the new buffalo, and travesian cloths, Silesias, and moleskins. Mr. David Madeley, Royton, near Oldham, is the exhibitor. There are many other exhibits which we shall have to describe in later issues of the Journal.

SILK SECTION.

This section includes a most interesting collection of ancient French, Italian, Genovese, Broussa, Cyprus, Damascus, and Bokhara silk fabrics, amongst which are figured velvets, brocades and other stuffs, mostly belonging to the sixteenth century. There is an extensive exhibit of Indian silk goods, typical of the different kinds of weaving, embroidery, and dyeing, practised throughout all the Indian presidencies. Amongst these will be found Muga silk embroideries of Dacca, in Bengal; Baluchar saris, in immense variety of colour and design, from Berhampur, in Bengal; Phulcaris, from Amritsar, in the Punjab, also embroidered in various designs in beautifully dyed silks, some samples being ornamented with circular pieces of looking-glass; soznis, or bed-covers—these are very handsome specimens of embroidery, worked in silk upon cotton cloth—probably away from Peshawur, where they were found by Mr. Wardle (Leek), possibly in Bokhara, although such examples are now made there; the bold treatment of masses of reds, blue, green, and yellow being very effective, and the designs generally denoting a breadth of conception unusual in embroidery. Crimson and scarlet are freely used side by side. There are short silk saris, and gold, silver and silk fabrics manufactured in various parts of the Bombay Presidency, also very rich bandhana or "tie-and-dye marriage robes from the territory of Gaikwar of Baroda, and figured woven silks from Surat. A cocoon reeling machine, to which is fitted a Tavelette consona, may be seen, daily, reeling Bengal cocoons; it is attended to by a cocoon reeler from the South of France. There is, too, a cocoon reeling machine suitable for cottage reeling in India, or for any of the colonies where cocoons can be produced, and where labour is cheap. The Government of India's Entomological Collection, illustrating Indian sericulture, has

been arranged by J. Wood Mason, Esquire, Assistant Superintendent of the Indian Museum, Calcutta. Next, there is a very important collection of ancient and modern silk goods of English production. This exhibit clearly proves that there is no need to import the most beautiful silks from the Continent; as they have been in the past, and are still, manufactured at home. The Duchess of Cambridge, the Honourable Mrs. Percy Mitford, Mrs. Leigh, of Lyme Park, and other ladies have contributed ancient fabrics to the collection. Messrs. Warner and Ramm, of 9, Newgate Street, London, E.C., have enriched the exhibit by a number of modern silks, woven in East London, and which, in design, colouring, and weaving merit, cannot be surpassed by any country's productions. One of the exhibits most likely to claim the attention of English visitors has been prepared by eight Coventry manufacturers, under the superintendence of A. S. Thompson, Esquire, J.P., the mayor of that town. It consists of two cases, containing examples typical of the various styles of silk manufacture for which the town is, and has been, noted; it includes satins, double satins, saracens, failles, satin and failles, with round, pearl and loop edges, plain and watered; brocades, serges, tartans, striped Roman sashes, brace webs, masonic ribbons, club colours, portraits woven in silk, &c.—Messrs. Pizzie and Cramp, 34, Earl Street, Coventry, are showing coloured ribbons, chenille and beadwork.—Mr. John Mason, Park Green Mill, Macclesfield, plushes, sashes, cut-ups, grenadines, silk squares, mufflers, ladies' handkerchiefs, &c.—Messrs. Robert Watson and Co., Surdah, Rajshahi, Bengal, have four glass cases, in which are exhibited Bengal mulberry silkworm cocoons, with specimens of raw silk reeled from them, showing, first, the imperfect native reeling, by which is obtained raw silk worth 6s. per lb., second, raw silk reeled in Anglo-Indian filatures by the usual method, worth 11s. per lb., and third, raw silk reeled with the Tavelette consona, introduced in the winter of 1885 and 1886, by Mr. Wardle into Bengal. This is worth 19s. per lb.—Messrs. Lewis and Allonby show a case of handsome figured silks woven in the East of London, and which, in point of beauty and excellence of weaving, demonstrate that England is as capable of manufacturing this class of goods as any continental country. The same case contains variously coloured twilled silks, woven in the Manchester hand-loom, and Tussur silks, and Tussur silk embroidery in its natural (fawn) colour.—Messrs. T. Bradwell and Co., Dane Mills, Congleton, show silk waste and spun silk made from it.—Messrs. W. H. Hammersley and Co., exhibit a case containing a handsome silk patchwork quilt, dyed and manufactured in 1850, and another one in which are shown dyed silks for all purposes.—Messrs. E. Yeomans and Son, 364, Hackney Road, London, show bleached and dyed Tussur silk in all shades, also trimmings manufactured from it, which are examples of the high state of perfection attained by both dyer and manufacturer in this silk, which is comparatively new to commerce.—There are also exhibited upholstery trimmings manufactured from Tussur silk by Messrs. Pitman, Sons and Co., 3, 4, and 5, Well Street, Falcon Square, London, E.C. This portion of the case is most tastefully arranged. The case contains an assortment of Tussur and other silks manufactured by Messrs. Harris and Sanders, of Leek, and 17, Silver Street, Wood Street, London, E.C., suitable for art, upholstery, and general purposes.—Messrs. J. Hadwen and Sons, of Kebroyde Mills, near Halifax, exhibit a very interesting case illustrating the manufacture of spun silk and spun silk fabrics from silk waste. Around the base are examples of the raw material used for this manufacture in the form of Bengal, Mysore, French, and Italian silk waste and Canton and Shanghai knubs. Within the hexagon, formed by these, are silks in the different stages of the carding and spinning processes, showing the dressed process, sliver, rovings, singles, and finished spun silk threads ready for the weaver, both in the dyed and undyed states. We may here state that Messrs. Hadwen and Sons are the oldest silk spinners in England, their firm dating from 1800. They made an exhibit in London in 1851, gaining the only medal for spun silks, and in the Paris Exhibition of 1878, where other honours were awarded to them. Next, we must mention the finished goods manufactured from spun silk, and which consist of lace from St. Pierre-les-Calais, in France, hosiery from Leicester, shawls and skirtings from Glasgow and Paisley, all made from spun silk manufactured by Messrs. Hadwen. Special attention should be given to the centre piece, which consists of Filoselle silk, in a variety of colours, arranged in the form of a fan, surmounting a series of coloured crewel silks. The dome is entirely composed of spun silk handkerchiefs, manufactured in Macclesfield by Messrs. J. Dunkerley and Sons, and Messrs. J. and P. Rowbotham.—Messrs. Clayton, Marsdens and Co., exhibit a case of waste silks, specimens in the various stages of preparation for spinning, and spun silk yarns arranged in a most tasteful manner. The very high degree of perfection to which spun silk has been brought, as seen in this firm's exhibit, is something admirable. The variety, too, of yarns now produced from materials once useless for manufacturing purposes, and of little or no value for any other, must ensure a wide field of consumption among manufacturers. A prominent feature in this exhibit is the Tussur or wild silk, the productions of a hardy species of silkworm which thrives in the woods of Northern India, China and Japan, where the natives hunt up and collect the cocoons. Unlike the cultivated and carefully-tended silkworm, the food of which is the leaf of the mulberry tree, this wild species feeds upon the leaf of the oak and castor oil trees. The introduction of this class of silk into this country is of recent date. Messrs. Clayton, Marsdens and Co., having worked the first consignment

from China, some twelve or fifteen years ago. Since then, the trade has gradually increased, and the Indian Government have done much to bring into use the Indian varieties. Among other steps, various consignments were made to Messrs. Clayton, Marsdens and Co., to experiment with, and report upon, the results being an increased supply of the raw material which, as well as the Chinese sorts, have more than quadrupled in value during the last few years. Among other uses to which the yarns from this peculiar silk are put is the very extensive one of the manufacture of a most beautiful fabric for ladies' jackets, &c., the new silk-seal plush—largely in demand for the American market, and which deserves to be better known at home, and the development of which is largely due to the enterprise of this firm. The machine twists, lace yarns, and varieties for other industries, are well deserving the attention of those interested.—The Bengal Silk Company, of which Messrs. Lyall, Marshall and Co., of Calcutta, are the managing agents, exhibit a series of Bengal raw silks of the kinds known in commerce as Rangamatty, Benjetty, Gonatea, Cossimbazaar. These are the silks reeled from the cocoons of the mulberry-feeding silkworm, and cannot fail to draw the attention of manufacturers to the capability of Bengal to supply raw silk equal to that of other silk producing countries.—The Leek Embroidery Society, Hon. Superintendent, Mrs. Wardle, of Leek, to whose taste is due the colouring of the designs, show some most interesting specimens of embroidery worked mostly in Tussur silk, of permanent dyes. The style of this embroidery is original, and the designs excellent, being generally of an Indian or Eastern character, and in the carrying out of which gold thread is freely used and produces a good effect.—Mr. J. O. Nicholson (silk manufacturer, Macclesfield), exhibits rich silk damasks and cotton furniture brocades, with examples of various materials and designs in dress silks, and all the usual Macclesfield productions. These are of high class manufacture, and prove that England can produce beautiful fabrics of silk in design and colouring. There are also exhibited embroideries worked at the Macclesfield Embroidery School under the guidance of Mr. Nicholson. These are of very varied character, consisting of portières, mantel borders, fireplace curtains, bed-quilts, piano covers, chair backs, &c., and embrace work upon silk plush, linen plush, cotton, and linen, and numerous characters of silk produced by Mr. Nicholson, who also manufactures the embroidering silk. Some of the designs have been executed by the designers of the Embroidery School, and others by G. F. Armitage, Esq.—The exhibit of Messrs. C. J. Bonnet et Cie., Lyons, is well worthy of that celebrated firm of silk manufacturers. Ladies will here find something interesting, and at the same time be able to learn what the manufacturer himself recommends to them for wear. The most conspicuous amongst the silks to which special prominence is given is "The Perfection of Silk," with the trade mark, a red eagle, and the arms of the Corporation of Manchester and of Lyons tastefully woven on the end of the piece. Messrs. C. J. Bonnet et Cie., make black silks only, but the exhibit is so well arranged and interspersed with their trophies of medals and various trade marks that, in spite of the materials being all of this sombre hue, the display is as pretty as it is interesting.—The well-known firm of James Pearsall and Co., of 155 and 156, Cheapside, London, have a very nicely arranged case, indeed, the case is a work of art, containing silks for art and other embroidery needlework. Their filo-floss, twisted embroidery, and rope silk, are dyed in the Eastern unfading dyes, the colours are simply unimprovable. They also show knitting, washing purse twist, and raw and other silks. Their modern dyed filoselles are arranged in gradation, in a variety of colours, and are most attractive. Satins, in unfading dyes, are shown in soft artistic colours.—Two exceedingly interesting cases of exhibits are displayed by the eminent firm of silk dyers, Messrs. Joshua Wardle and Sons, of Leek. One of them contains an extensive range of colours in fine silk for weaving purposes, "soft" and "souple," as well as a series of beautiful examples of Tussur silk, bleached and dyed in delicate shades for chenille and kindred purposes. This case is further decorated with Indian Corah silks, dyed in fast colours. The other case contains pieces of very gracefully folding silk gauze, dyed in fast and artistic colours, surmounting a series of coloured sewing silks, applicable more especially to the Leek trade; examples of "raven" sewings and sewing machine twist, with a beautiful variety of embroidery silks, filoselles, &c. There is also a good display of Tussur silks, raw, organzine, and tram, and of woven fabrics.—Messrs. J. Vanner and Sons, of London, exhibit black umbrella silks, with examples of the silk used in weaving them, in various stages of manufacture.—Messrs. W. Chorlton and Co., 29, High Street, Manchester, exhibit a large series of black silk crapes.—Messrs. H. Hogg and Son, silk throwsters, of Congleton, and Mr. J. Godwin, silk manufacturer, of Macclesfield, have conjointly made an interesting exhibit of silk handkerchiefs, which are good examples of the weaving of this district.—Messrs. Henry Tucker and Co., Castleton Silk Mills, Rochdale, have a most interesting exhibit, showing the developments of Tussur silk, as well as examples of ordinary silk manufactures. This includes silk and Tussur silk threads, printed silks, figured woven silks, and a large assortment of Tussur silk plushes of various colours.—Messrs. J. Milligan and Son, of Spring Gardens, Buxton, exhibit hosiery goods manufactured of spun silk.—Messrs. Kershaw and Swindells, silk manufacturers, Macclesfield, a hand-loom, which will be in work daily during the Exhibition, weaving portraits in silk of the Queen and leading statesmen.—The Pure Silk Manufacturing Company, Vicenza, Italy, a village loom (which will also be at work daily during the Exhibi-

tion), such as is used in Switzerland for weaving black silks.—Messrs. Briggs and Co., of 8, Church Street, Manchester, exhibit extensively all classes of silks for sewings, embroidery, and tailors' and milliners' uses. The silk is shown, from the raw state, through each successive process to the finished needlework. They will also exhibit their patent method of tracing designs for embroidery, &c., which will be worked practically daily during the Exhibition. The very handsome specimens of embroidery are all from designs in Briggs' transferring papers, and the silks used are entirely of their own manufacture.

IRISH FABRICS.

In the section set apart for fabrics of various kinds, as manufactured in Ireland, there are some admirable specimens of goods. Of course, the pre-eminence must be given to the linen fabrics, in which the leading manufacturers of Ulster have vied with each other in displaying their goods to the greatest advantage, and have succeeded to such an extent that a largely increased business in the future will result from the excellence of their exhibits. The merits of the various fabrics are such that the palm cannot be given to any individual firm. Messrs. J. S. Brown and Sons, of Belfast, show a varied assortment of damask table linens, towellings, handkerchiefs, &c., in fancy and plain materials, and also an admirable display of flax in various stages of manufacture. F. W. Hayes and Co., Banbridge, have a collection of threads for hand and machine use. The Brookfield Linen Co., Belfast, have a large show of plain and fancy linens, including damasks, diapers, striped and checked drills, linen canvas in various colourings, costume cloths, glass and other cloths, handkerchiefs, &c. This display is large and varied, and reflects credit upon the producers. Messrs. Murphy and Orr, of Belfast, show a Jubilee design in a linen and silk damask table cloth, which will no doubt be much admired. They also exhibit linen and silk tea cloths. Messrs. J. N. Richardson, Sons and Owden, North Belfast, are well to the front with damask table covers, napkins, tray, and toilet cloths, and also with a large assortment of linens for shirtings, handkerchiefs, pillow cases, &c. Messrs. W. Barbour and Sons, Lisburn, have linen threads in hanks, balls, &c., for nearly all purposes for which linen threads are used. The Ulster Linen Trade exhibit, which is shown under the auspices of the Belfast Linen Merchants Association, Belfast, is supplied by the various firms, connected with the industry, scattered over the province, and will be therefore an index of the whole linen trade, as the Association has been at much trouble in collecting together a varied assortment of specimens, from the raw material to the different classes of yarns and manufactured fabrics produced in Ulster. The entire, and various processes through which the flax passes, from the seed to the finished goods, are shown. The cases of exhibits contain flax seed; flax in the raw state and in various stages of spinning; flax yarns, grey, bleached and dyed; flax threads, suitable for shoemaking, tailoring and other purposes; textiles made from flax, including grey, dyed, printed, bleached and figured linens and unions; rough browns, hollands, buckrams, coat paddings, canvases; drills, towellings, glass cloths, linens, curtains, table and other damasks, furniture and other coverings, carriage rugs, handkerchiefs, shirtings, &c. This exhibit will undoubtedly prove highly interesting to any observer, and will show what rapid strides have been made, during recent years, by those engaged in the different branches of the linen trade in the north of Ireland. There are other minor exhibits of linens, but the above are the leading ones. In woollen goods, the show is excellent, and mostly of the class for which the few firms engaged in this branch of textiles in Ireland have generally been celebrated. McCormick Cannon, of the Glenties, Co. Donegal, shows home spun and hand made grey tweeds, friezes, and white flannel. These are of great merit. Charles J. Maybury, Kenmare, exhibits woollen threads for various purposes. The Convoy Woollen Co., Convoy Raphoe, Co. Donegal, have an excellent and varied assortment of ladies' and gentlemen's heavy and light tweeds, travelling rugs, shawls, horse covers, flannels, shirtings, hosiery and yarns. Hill and Sons, Laican Mill, Dublin, show friezes, tweeds and serges. The Athlone Woollen Mills Co., Athlone, exhibit Irish tweeds, Shannon tweeds, Connemara tweeds, Cheviots, Saxonomies, wool serges and Irish dress goods. Also various fingering wools. The Caledon Woollen Co., Caledon, Tyrone, have Irish tweeds, friezes, blankets, rugs, serges and costume cloths. M. Mahoney and Bros., of Cork and Blarney, have a good display of Blarney and Shamrock and fleecy wools, and also knitting worsteds and yarns, Blarney tweeds, boating serges and worsted coatings. F. and J. Clayton, of Navan, have worsted coatings, meltons, beavers, pilots, saxonomies, cheviots, friezes, plaids, blankets, flannels, rugs, dress goods, and yarns of various kinds. The Marquis of Waterford's woollen mills, Kilmacthomas, show woollen goods and tweeds. In hosiery goods, the exhibits are of much merit, and the exhibitors have brought together a very effective display of this class of wearing apparel, both for ladies' and gentlemen. Messrs. Smythe and Co., of Balbriggan, have different classes of ladies' and gentlemen's cotton, cashmere and merino hose. Messrs. S. R. Greer and Co., Newtownards, show knitted suits, hose and half hose, for boys' and ladies' and gentlemen's cardigan jackets, vests, jerseys, hats and costumes. Messrs. Pim Bros., Dublin, show a large variety of stockings and half hose knitted by Irish peasantry; art crochet work petticoats, shawls and fancy wool goods; the whole of the work and designs having been done by Irish hands. But, perhaps, the exhibits in this section that will draw the most attention from visitors to the Exhibition, will be the "Women's industries," of which so much has been heard

during the past few years. This collection is so large and varied that the space at our disposal will not permit of us giving particulars of the whole. The Superiress of the Presentation Convent at Youghal shows a variety of lace work, including needlepoint and other kinds. From a number of other convents comes a quantity of lace work adaptable to various classes of fabrics. Mrs. Power Lalor, Long Orchard, Templemore, has a very large and excellent display of laces both for wearing apparel and for other purposes. The Royal Irish School of Art Needlework Co., Dublin, have a very effective show in textile and other goods. Mrs. J. W. Sinclair, Inver, Donegal, has some really admirable specimens of embroidery on tapestry, satin cloth, handkerchiefs, &c. Mrs. Dease, of Turbotstown, West Meath, also exhibits embroideries of much merit, and table covers, ornaments for chair backs, &c. A number of other ladies show knitted goods of various kinds. On the whole, the exhibits in the Irish section show us that as manufacturers of textiles of nearly any kind, they are not behindhand, and judging by the various displays, their merit is much above the average of the productions of many other countries in the classes of goods exhibited.

The Yorkshire Jubilee Exhibition at Saltaire.

The Yorkshire Exhibition was opened at Saltaire on the 6th of May by H. R. H. Princess Beatrice. The Exhibition is being held in connection with the Salt Schools, a handsome block of buildings, which has for the occasion been transformed into an Art Exhibition of a very high order. Behind the schools, a commodious structure of wood has been erected, and gardens laid out, containing a large concert hall and other interesting features, for the amusement of visitors. In the industrial section, with which we have to deal, a varied collection of machinery and appliances has been got together, in fact, so large has been the demand for space that, without the slightest difficulty, a building more than double its present size could have been filled. The result of such a demand has been that the executive has been able to make their allotments in such a manner as to ensure the most representative display. It is, therefore, needless to say that the exhibition is well worthy of more than one visit. It is our intention to give, in this number, merely an outline or summary of those features and displays which tend to make a good exhibition, reserving, until our June number, detailed descriptions of exhibits which are particularly interesting to textile manufacturers. At the outset, we may state that the building is fitted up with every convenience, there being postal, money order and telegraph offices, telephone call offices, and a bank, the benefits of which will be duly appreciated. With these introductory remarks, we will give a summary of the exhibits.

Messrs. HICK, HARGREAVES AND CO., Bolton, are the makers of the engine which drives the whole of the machinery. This Firm also supplies an engine of the same type for driving a portion of the machinery at the Manchester Exhibition. Particulars will be found in another column. H. R. H. Princess Beatrice started the engine at Saltaire, on the opening day, by the aid of an automatic barring engine, which moves into gear by means of an electric switch, fixed to a table. The barring engine moves the main engine until it takes its own steam and starts off by itself, when the former falls out of gear.

Messrs. EDWARD GREEN AND SONS, of Wakefield, and St. Ann's Square, Manchester, are showing one of their New Patent Fuel Economisers, for which no fewer than sixteen prize medals have been awarded by the jurors of the principal exhibitions at home and abroad, since, and including, the London Exhibition of 1851. These economisers are constructed for extreme high pressures, they heat the feed-water with the residual heat to a temperature above boiling point, and as provision is made against incrustation and muddy water, they contribute largely to the durability of boilers, whilst their liability to get out of repair is reduced to a minimum. The economiser is to be seen at work, and steam users will do well to pay it a visit. Reference is made on another page to the economiser on view at the Manchester Exhibition.

Messrs. CHATWOOD'S, Bolton and Manchester, the eminent makers of safes and locks, have several of their Fire, Fall, and Burglar Proof Safes on view, for which they have received the highest possible awards at the English, Colonial, and Foreign International Exhibitions, over twenty-first prize medals having been obtained by them. So far back as 1865, the official report of the Dublin Exhibition, says:—"Mr. Chatwood has raised safe manufacture to an important branch of practical engineering." A reference to their Manchester exhibit is given on another page. Before closing our remarks, we may add that Messrs. Chatwood have on view, at their Manchester office, a safe which was exposed to fire for a great length of time, and remained intact.

The "SIMPLEX" PATENT MECHANICAL STOKER, the makers of which are located at 8, Trueman Street, Liverpool, is on view, and will, no doubt, receive a large amount of attention, as the subject of smoke abatement is of vital importance to steam users. By a reference to the apparatus on view, its working will be readily understood. The coal, after passing through the hopper, is carried towards each furnace by a helical ram, driven by a ratchet and pawl, and deposited upon revolving shovels, by which it is distributed over the furnaces. The shovels are constantly

revolving and, therefore, all unnecessary springs, tappets, buffers, &c., are done away with. A regular and even distribution of fuel upon the fires is secured, and the quantity required can be altered or regulated in the easiest possible manner by simply adjusting the throw of the pawls. The rams are separate from each other, and can be worked independently, so that the feed can be stopped from one fire, whilst the other can be kept in full work at pleasure. There are many advantages to be gained by using this stoker. It saves fuel, whilst increasing the power of the boiler, and the steaming is also steadier, each fire can be worked independently without opening the fire doors. It requires little power to drive it, abates the smoke nuisance, and can be fixed to any furnace in a few hours. Its construction is simplicity itself.

Messrs. MATTHEWS AND YATES, 35, Lever Street, Manchester, show the Crossley patent air propeller, an improved apparatus for the propulsion, suction, and movement of air, fluids, and gasses. The mechanism is at work, and shows it as adapted for moving large volumes of air, at low pressure, for the ventilation of mines, tunnels, mills, workshops, and buildings. It may also be used for the drying processes of various materials, for winnowing, and for all similar purposes. The apparatus is now well known, and largely used, its adaptability to the above purposes having been fully tested. This Firm also shows their patent automatic closing doors, fixed upon the propeller in such a manner that, when the fan is at rest, they close the tube of the apparatus, and so prevent the ingress of cold or other air. They, too, show a patent "Humidifier" for moistening the atmosphere in textile and other establishments, where it is requisite that a moist air should pervade the works.

Mr. JOHN COOKE, Folly Hall, Huddersfield, is exhibiting specimens of pipes covered with his non-conducting composition or cement, which will, with ordinary care, last twenty years, whilst a great saving in fuel is effected by its use. Mr. Cooke also shows a special finishing mixture that, when applied to pipes covered with composition, imparts to them a finished appearance, whilst steam and water have no effect upon them. Samples of scale are shown, these having been taken from boilers by the aid of a patent lubricating boiler compound made by Mr. Cooke. There are also samples of cement, concrete flooring for mills, warehouses, etc., and also cheap black and red varnishes for use in such places.

Mr. C. E. HALL, of the Standard Iron Works, Sheffield, exhibits:—1st. An automatic, continuous or intermittent hoist, for raising or lowering parcels, goods, merchandise, etc., from one floor to another. This is accomplished by an arrangement of swinging shelves or platforms, placed equi-distant along, or upon, two vertical stands of Mr. Hall's patent eclipse chains, upon which goods to be transported vertically are placed. Motion is communicated to a worm and worm-wheel; these work in communication with a slotted lever, which is caused to vibrate to and fro by a pin and die fixed in the worm-wheel. A ratchet and wheel propel the chain wheels during one-half of the revolution of the worm-wheel; during the other half, these wheels remain stationary, so that time is given to load or unload the platforms or shelves. If it is desired to make the hoist continuous, a clutch is inserted into one of the wheels by a lever from the bottom, and the chains work continuously. Numerous samples of Mr. Hall's other specialities are also shown, such as stamped steel buckets for elevators, rivetted steel buckets, cast buckets, patent chains of all sizes, now extensively used in collieries, lead, copper, silver, gold, and diamond operations.

Mr. J. PERRY, Shipley Fields, Frizinghall, Bradford, shows a full set of machinery for woolcombing, which makes a good display, and includes a gill box machine, a backwash machine, a balling frame, a Noble's combing machine, and a finishing gill box. The exhibit forms a representative collection of machinery of a very high order, for the making of which Mr. Perry is well known. We hope to give a more lengthy description of this exhibit in a later issue.

Messrs. SHAW, HARRISON AND CO., of Birksland Street, Bradford, show their "Sensim" screw gill preparing machine, an apparatus which, in many respects, is a distinct departure from machines for preparing wool for combing. In a former issue of this Journal, full particulars of this mechanism were given, and, in our next issue, we purpose giving a further detailed description of the latest improved machine. For preparing various classes of wools, and especially mohair, it does its work in a very efficient manner, and, undoubtedly, it will be an exhibit which will attract more than an ordinary amount of attention, during the time the Exhibition is open, from those who are interested in this class of textile machinery.

THE WOODHOUSE AND RAWSON ELECTRIC CONTRACT AND MAINTENANCE COMPANY, LIMITED, 35, North Parade, Bradford, are the sole contractors for the electric lighting of the Exhibition Buildings. The lamps used are Statter's patent, manufactured specially for this Company, who are the sole agents for Yorkshire, Lancashire, and Cheshire. The whole of the dynamo power has been supplied by Messrs. Mather and Platt, Salford Iron Works, Manchester. Above the dynamos, a gangway will be constructed to allow the public to inspect them. The whole of the wrought iron pulleys, thirteen in number, for driving the dynamos, have been made and supplied by Mr. T. Metcalfe, St. James's Iron Works, Moss Street, Bradford. The belting, in this section, has been provided by Messrs. J. White and Sons, Bingley, as well as that used for driving the shafting. There are twelve belts, varying from 8in. to 12in. in width, made of double leather, and sewn with copper wire. We shall give further particulars of the electric lighting in our June number.

Mr. WILLIAM HANSON, Quebec Works, Thornton Road, Bradford, has a show of steam pumps. This maker has a thoroughly practical understanding of the requirements of an effective steam pump, and, therefore, those on view will give satisfaction to all who are interested in the subject of raising water. The efficiency and finish of these pumps is of a first rate order. The working parts are firm, being fixed on a substantial cast iron bed. Any water leakage from the stuffing boxes is caught and drained away. The glands and stuffing boxes are of the most durable character. All the necks are unusually large, thus ensuring a minimum of wear and tear,

and the crank shaft is much stronger than usual. For feeding boilers with water, or as fire engine appliances, these pumps are of a high degree of merit.

Messrs. PLATT BROS., Oldham, have a complete set of preparing and combing machinery which can be seen running. The set consists of a lap gill box, Little and Eastwood's patent circular woolcomber, and a double finishing gill box. These present a high state of perfection as is invariably the case with machinery turned out by a firm so widely known as Messrs. Platt Bros. A further reference to this firm's machinery is given amongst the exhibitors in the article on the Manchester Exhibition, and we shall probably have more to say in our next issue.

Messrs. SOWDEN AND SONS, loom makers, who have lately removed from Bradford to commodious works close to the railway station at Shipley, are showing four of their well known looms, all these are busily running. One is a broad loom for weaving worsted coatings, and the others are for weaving dress materials.

Messrs. J. LEEMING AND SONS, Valley Road, Bradford, exhibit three broad looms, which possess very interesting features, and cannot fail to command the attention of manufacturers. They occupy a most prominent position in the Exhibition.

Mr. JAMES PROCTOR, Burnley, shows one of his patent mechanical stokers and fire bars, a well known apparatus for superseding hand firing. It works noiselessly, the ram and box being so arranged that the crushing rollers and gearing are dispensed with, whilst large coal may still be employed. A lantern wheel is used instead of a tappet, which is an easier motion, and reduces the wear to a minimum. The shafts and bearings are easy to lubricate, whilst they are screened from the heat of the furnace. The buffers and buffer springs are entirely dispensed with. The stoker is easily fitted to any existing furnace.

Messrs. BEAVER AND DORLING, Dewsbury, show a first class specimen of a high-speed engine. It is capable of working at six hundred revolutions per minute. It has been specially constructed for electric lighting purposes.

Messrs. JOHN INGHAM AND SONS, Croft Head Works, Thornton, near Bradford, have a case on view containing shuttles and pickers for weaving a variety of fabrics. They also show specimens of shuttle pikes for spools, pirns, and cops. This Firm has a similar case on view at the Manchester Exhibition.

The BLACKMAN AIR PROPELLER CO., London, exhibit their patent air propeller for drying purposes in textile and other works, and also for ventilating buildings generally. We have put the merits of this propeller before our readers on a former occasion. The apparatus is in working order. It is also on view at the Manchester Exhibition.

YARNS AND FABRICS.

In yarns and manufactured fabrics, some capital specimens of Bradford goods are exhibited on "The Bradford Trophy." This is representative of the principal textiles made in the district. Yarns are contributed by Messrs. Robinson and Smith, and A. Hoffmann and Co., and fabrics by the following firms:—Messrs. T. Salt, Bart and Co., Milligan, Forbes and Co., J. Holdsworth and Co., M. Bottomley and Co., Kessler and Co., J. Phillip and Co., T. Riley and Co., W. and C. Dunlop, A. and S. Henry W. Denby and Sons, J. V. Godwin and Co., E. Ripley and Son, Law Russell and Co., C. Semon and Co., Schuster, Fulda and Co., Rendell and Smith, F. Wallace and Co., and Mr. G. Richardson. The goods have been draped upon a structure designed by Mr. J. Ledingham. "The Leeds Trophy," contains some admirable examples of fabrics, &c., made in that district; Messrs. Titley and Son, show flax and threads, and linen goods are represented by Messrs. R. Buckton and Son; felts by the Patent Woollen Cloth Co.; woollens are exhibited by Messrs. Hargreaves and Nussey, T. Pawson and Son, J. and E. B. Padgett, Fernside and Glover, Newsome, West and Co., and Smith and Hutton. Ready made clothing is also shown by Messrs. J. Barran and Sons, and Gaunt and Hudson. In sewing silks, Messrs. C. D. Rickards, of Bell Busk, has an ornamental case built of reels or bobbins of silk, and Mr. George B. Unsworth, of Green Lane Mills, Derby, exhibits thrown silk cord, and twisted laces, &c. Professor Hummel, of the Dyeing Department of the Yorkshire College, has brought together an admirable series of woollen patterns dyed by the students at the above college. They show the capabilities of the old dye woods, and the new coal-tar colouring matters. In connection with dyeing, the following Leeds firms exhibit different colouring and other compounds used in the industry:—Messrs. T. Crossley and Co., Wood and Bedford, J. Marshall, Son and Co., Hirst, Brooke and Hirst, and Messrs. Harrison, Parkinson and Co., Bradford, show chemical and other apparatus, for testing materials used in manufacturing processes. A case of chemicals and coal-tar colours is shown by Messrs. Sadler and Co., Middlesbrough. Messrs. Brooke, Simpson and Spiller, London, exhibit colours derived by coal-tar, and certain proximate raw materials from which they are produced, and also specimens of materials coloured and dyed with the same.

ORIGINAL DESIGNS.

Our first plate contains a design suitable for Embossed or Woven Plush for upholstery purposes. It is the work of Mr. R. T. Lord, 97, Park Road, Bradford.

* * * *

On our second plate, we give designs for Cotton Dress Goods. These will be found to represent the leading styles in that class of material.



EMBOSSSED PLUSH.



Design No. 44



Design No. 45



Design No. 46



Design No. 47



Design No. 48



Design No. 49



Design No. 50



Design No. 51



Design No. 52



Design No. 53



Design No. 54



Design No. 55



Design No. 56

These designs are for
cotton dress goods, and are
designed for the purpose of
showing the effect of the
color and pattern of the
fabric when used in the
construction of a dress.



Design No. 57



Design No. 58



Design No. 59



Design No. 60

FASHIONABLE DESIGNS.

Fashionable Suitings.

No. 452.



Plan. Pegged to fall.

Warped :—2 ends White.

1 end Pea Green.

1 „ White.

2 ends Pea Green.

2 „ White.

1 end Black.

1 „ White.

2 ends Pea Green.

2 „ White.

1 end Pea Green.

1 „ White.

1 „ Pea Green.

1 „ Black.

2 ends White.

1 end Blue.

1 „ White.

2 ends Blue.

2 „ White.

1 end Black.

1 „ White.

2 ends Blue.

2 „ White.

1 end Blue.

1 „ White.

1 „ Blue.

1 „ Black.

2 ends White.

1 end Blue.

1 „ White.

2 ends Blue.

2 „ White.

1 end Black.

1 „ White.

2 ends Crimson.

2 „ White.

1 end Blue.

1 „ White.

1 „ Blue.

1 „ Black.

2 ends White.

1 end Blue.

1 „ White.

2 ends Blue.

2 „ White.

1 end Black.

1 „ White.

2 ends Blue.

2 „ White.

1 end Blue.

1 „ White.

1 „ Blue.

1 „ Black.

108 ends in pattern

Warp and weft all 26 skeins woollen.

Woven :—3 picks White.

2 „ Green.

1 pick Black.

3 picks White.

2 „ Blue.

1 pick Black.

3 picks White.

2 „ Crimson.

1 pick Black.

3 picks White.

2 „ Blue.

1 pick Black.

4,080 ends.

60 „ per inch.

60 picks „

20's slay.

3 ends in a reed.

68 inches wide in the loom.

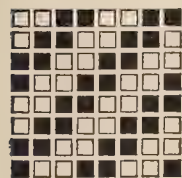
56 „ when finished.

Scour and mill to width.

Finish soft and clean.

Weight 24 ozs.

No. 453.



Design.

2,304 ends.

36 „ per inch.

33 picks „

18's slay.

2 ends in a reed.

8 healds.

64 inches wide in the loom.

56 „ when finished.

Straight Draft.

Warp :—8 ends Black woollen, 18 skeins.

4 „ Black „ 1/40's, twisted to Green Olive 1/40's woollen, 10 runs per inch.

8 „ Black woollen, 18 skeins.

☒ 1 end Black „ 24 „ twisted with 2/40's Black cotton, and then twisted to 1/20's Crimson worsted, knob twist.

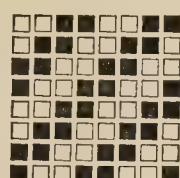
2 ends Black woollen, 1/40's skeins twisted to Bismark Brown 1/40's, 10 runs per inch.

☒ 1 end Black cotton, 2 threads 2/40's twisted to Blue worsted 1/20's, knob twist, and then twisted to Crimson worsted 1/20's, knob twist, 10 runs per inch.

Woven as warped, with the exception of twist marked ☒ thus. To be crossed here with 2 threads 2/40's Black cotton twisted to Crimson worsted 1/20's, knob twist, and then twisted to Light Green worsted 1/20's, knob twist, forming one thread.

Woollen Suiting.

No. 454.



* Design.

Warp :—

2 ends Mid Grey (Black and White Mixture, spotted with White), 2/14's woollen.

1 end Pea Green 1/14, twisted to Green Olive 1/14.

2 ends Olive and White Mixture spotted with White, 2/14's woollen.

1 end 2 threads coarse White worsted 2/36's, twisted to single 12's Crimson worsted, and looped with Crimson in twisting.

2 ends Mid Grey (as above), 2/14's woollen.

1 end Pea Green „ „

2 ends Olive Mixture „ „

1 end 2 threads coarse White worsted 2/26's, twisted to single 12's Blue, and looped with Blue in twisting.

1,240 ends.

20 „ per inch.

20 picks „

10's slay.

2 ends in a reed.

62 inches wide in the loom.

56 „ when finished.

Woven :—

3 picks Black 2/14's woollen.

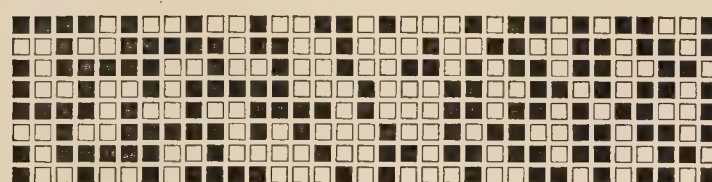
1 pick Black twisted to 1/14's

Brown and Green Mixture.

Twist 5 runs per inch.

Worsted Trousering.

No. 455.



Pegging Plan.

2/36 face worsted } on one beam.
2/40 silk }

14 Angola weft.

19 skeins Angola } on separate
backing warp } beam.

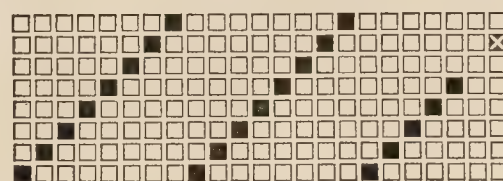
12's slay.

62 inches wide in the loom.

54 to 56 inches wide when finished.

Fancy Worsted.

No. 456.



Draft.



Pegging Plan.

All 2/56's worsted.

☒ 3 ends in one heald.

16's slay.

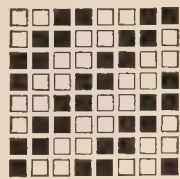
4 ends in a reed.

64 inches wide in the loom.

54 to 56 inches wide when finished.

Woollen Trousering.

No. 457.



Design.

2,048 ends.

32 „ per inch.

30 picks „

4 ends in a reed.

8's slay.

64 inches wide in the loom.

56 „ when finished.

Straight Draft.

Weight 24 ozs.

Warp :—

12 ends Black, 2/24 skeins woollen Cheviot.

1 end Black, 24 skeins twisted to Orange, 24 skeins

1 „ White, 24 „ „ Green, 24 „

1 „ Black, 24 „ „ Orange, 24 „

1 „ White, 24 „ „ Crimson, 24 „

1 „ Black, 24 „ „ Orange.

1 „ White, 24 „ „ Green.

1 „ Black, 24 „ „ Orange.

1 „ Black, 24 „ „ Crimson.

Woven all Light Grey Cheviot weft, 2/24 skeins woollen.

Fancy yarns all 8 runs per inch.



MONTHLY TRADE REPORT.

Wool.—The London wool sales closed last month, a large quantity of wool having been sold at about the average rates ruling at the preceding sales. In the Yorkshire and Scotch districts, wool has been bought sparingly, and only for actual requirements, and, consequently, there has been a slight downward tendency in prices. Botany, and the finer classes of other wools have sold moderately well, as have also long stapled medium qualities, but other sorts have been neglected. Short wools and noils have been difficult of sale. Yarns and pieces, especially the latter, have met with less attention, orders which have been given, have only been small in quantity and number, and the prospect of an early improvement in demand is not hopeful. Merchants are continually offering lower prices, so that margin for profit is almost nil, yet, in order to keep machinery partially, if not wholly employed, spinners and manufacturers are often compelled to accept rates which leave little or no profit.

Cotton.—The sales of raw material have been about an average, and prices on the month, although they have as usual fluctuated, have not shown much appreciable difference. Yarns have been slower of sale, and prices for nearly all classes, show a slightly downward movement. Orders have been few, and these offered at such rates, that spinners, who have work in hand for a little time, have preferred running this nearly to the end, to accepting orders at a reduced rate. The cloth trade has also fallen off in demand considerably, and, as to prices, the same remarks apply. Both spinners and manufacturers, in the Lancashire districts, have already commenced to talk of running short time, and unless prices in the early future should turn out more remunerative, with a corresponding increase of orders, there is likely to be a reduction of the output within a short time.

Woollen.—This branch of industry, which has shown a briskness for some time past, was much quieter during last month, although a large quantity of goods have been produced. The finer classes of worsteds, especially those in good and new designs, have had about an average demand, and, judging by accounts of this branch, they are likely to keep the lead for some time to come. In medium qualities, not so much has been done. In woollen, of a tweed and cheviot character, there has also been a falling off in demand in the better and medium classes, but for the clothing trade, there has been about an average business done, as manufacturers of ready-made clothes have been extremely busy, many of them running overtime, and, in consequence, they have, in numerous instances, given repeat orders for the lower classes of cloths. In the production of cloths, manufacturers are still vying with each other in the matter of design and excellence of finish in their fabrics, and where much colour is required, they are issuing some admirable patterns, in great variety and texture of material.

Linen.—This branch has improved considerably in demand during the past month. In damask table covers, and such like cloth, in which beauty of design is one of the leading features, a larger business has been done than has been the case for some time, and the prospect for the future seems cheering. Narrow goods, as towellings, toilet cloths, and such like fabrics, have also felt the improvement in demand and prices. Sheetings, and materials of that class, have had about an average demand. The flax and jute trades have ruled much quieter, there having been a considerable falling off in business, and prices generally have had a downward tendency.

Lace.—The curtain trade has kept moderately well employed, but new orders are given out very sparingly, and, generally, at lower rates; unless the business brightens speedily, many machines will be put out of work. Cotton millinery laces have been much sought after, and the same may be said of torchon and such like laces. Silk goods have been quiet, with few inquiries, and fewer new orders. Hosiery has ruled rather quiet. Prices for nearly all classes of goods are unsatisfactory, even in those descriptions that meet a fair demand.

Glasgow Chamber of Commerce and Fair Trade.

At an adjourned meeting of the Glasgow Chamber of Commerce for the purpose of renewing the discussion on Fair-trade and Free-trade, three motions were before the meeting.—First, "That this chamber is of opinion, that the time has come for reconsidering the whole question of our fiscal relations with foreign countries, and in expressing this opinion, the chamber declares that the industrial, agricultural, and commercial classes, in Great Britain and Ireland, ought not to continue any longer to regard with indifference the ruin effected and impending, upon their interests and welfare, by the inequitable competition in international commerce to which they are subject through the trade bounties and hostile tariffs of other countries; second, that this chamber again expresses adherence to the principles of free-trade, which have been the means of developing the commerce of this country, and deprecates any interference with the present fiscal enactments; and third, that this chamber believes that the trade bounties and protective tariffs of other countries are operating prejudicially upon the trade of Great Britain and Ireland, and is of opinion that the question should be considered whether, by means of some change in our fiscal relations with these countries or otherwise, relief can be obtained." On a division taking place, 88 votes were given for the third motion, against 59 for the second. The first motion was then placed against the third, with the result that the former was negatived without a division, and the third motion declared carried.

Wool Extracting in the West Riding.

Captain May, R. N., in the report of "Her Majesty's Chief Inspector of Factories and Workshops," gives a description of the process of wool extracting, and after referring to the danger arising to life and limb from explosions says:—"The best preventative of these explosions, I know of, is the introduction of a jet of steam into the interior of the machine. Where this plan has been adopted, the explosions have either ceased altogether, or have been so slight as to be harmless. Other means of prevention are found in allowing the rags to cool after leaving the carboniser, and providing sufficient fan power to remove the dust rapidly from the machine, with a free escape into an enclosed chamber, or, still better, into the open air. It is also most important that the fan and dust passages should be kept as clean as possible. The risk of injury is greatly reduced by making the workman stand at the side of the machine when closing it, and by lifting the closing shutter by means of a chain or cord carried to some distance through pulleys overhead. I would point out the resemblance between these explosions and those which have taken place in the dust chambers of flour mills."

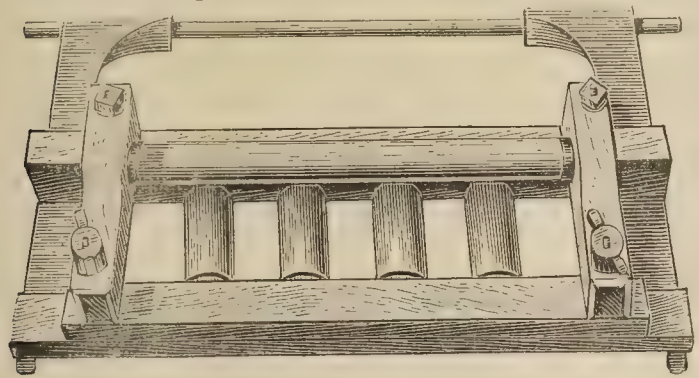
A New Waterproof Process for Bradford Goods.

"Royal Letters Patent" have been granted for a process by which certain cloths are made waterproof. Up to the present time, "waterproof" has had two meanings, in the first place it referred to the old method of waterproofing tweeds, and, secondly, to the adaptation of it to all wool imperials—a fine twilled cloth for ladies' over-cloaks. This process was carried out by putting the fabric through a solution of alum and sugar of lead, and in this way covering the material with a thin coating, which was waterproof so long as no friction was brought to bear upon the goods so treated; then we have india-rubber coated garments, but to these sanitary objections are constantly raised. The inventor of the new system of "waterproofing" claims his plan to be the only really permanent and hygienic method yet produced. Only specially prepared cloths are suitable for treatment by the new process, but there are so many different styles and qualities of the material that it comes within the reach of the multitude. The cloth, after treatment, is left as porous as in its original state, yet, when exposed to rain, the water runs off, every fibre of the material being so saturated with the solution as to be alike impervious to wet, damp, and mildew. Hence, it can be spunged, ironed, and dried—re-wet, dried again and again, and each time the garment is equal to new as a 'rain repellent.' For ladies' rain or shower proof cloaks, for spring or summer suitings and light overcoats, for men's wear, rain-repellant cloth is alike invaluable. The process has been most severely tested, and the fabric does not change or shrink. By the eye it is impossible to detect the presence of the 'rain-repellant' property, and doubtless this fact is largely in its favour, as it will probably be adapted also to costume cloths, and so become in wearing apparel what the 'damp-proof course' is in architecture."

MACHINERY & TOOLS, & C.

Asquith's Improved Draught Board for Milling or Fulling Machines.

Perhaps in no class of machinery used in the woollen manufacturing industries has there been so few improvements made as in milling or fulling machines. With a little thought from those specially interested in this class of apparatus, many improvements could be carried out which would considerably enhance their value. Mr. J. D. Asquith, machinist, Queen's Mills, Morley, near Leeds, has received provisional protection for a patent for an improved draught board, which, though exceedingly simple, will be found of great importance in practical work. In the draught board of milling machines in general use, the bars across the board between which



the cloth runs are stationary. With these bars, in the process of milling, there is a certain amount of friction on the fabrics, this friction, of course, acts upon the cloth more or less, producing flocks, and lessening the value of the piece. To obviate this friction,

Mr. Asquith, in place of the fixed bars, uses rollers; the fabric, in passing between the rollers, causes them to revolve, and this motion allows the cloth to pass through more freely, and from actual experiments, the making of flocks is reduced to a minimum. The rollers which run in sockets or bushes, are made of wood, brass, porcelain, or any other suitable material. They may be removed in a few seconds, when occasion requires, and replaced again, by unscrewing the nuts (as on front of illustration given) and withdrawing the upper portion of the front of the draft, when the rollers are left free to be lifted out. The above illustration shows a draught board, through which the cloth passes between single rollers; but it is also made with rollers running in pairs; this principle is the one that finds much favour and has been already adopted by numbers of users of this class of machine. These rollers may be applied to any existing machines, at a very small cost, and Mr. Asquith will give particulars of prices, &c., on applying at above address.

Electro-Plated Printing Cylinders of Copper-Faced White Metal.

M. Depierre has sent to the Industrial Society of Mulhouse a novel cylinder for a calico printing machine. It is composed of a white alloy, coated with copper, which is deposited by electrolyses, and is much less costly than the copper cylinders now in use. Many attempts have been made from time to time to reduce this cost, but without any great degree of success, until about four years ago M. Depierre commenced his experiments upon an alloy composed of zinc and tin, the proportion of the latter being small. It is necessary, in order to obtain good results, that the metals employed should be free from impurities, especially from arsenic; that the molten mass should be kept homogeneous at the time it is poured into the mould, and that the casting should be chilled rapidly under great pressure. To this alloy, which admits of being turned in the lathe and polished, the electro-plated copper adheres firmly, and presents a surface which can be engraved either by hand or pantograph in the ordinary way. If dies be employed, a little less pressure than usual should be given, the character of the engraving, depth, etc., being equal. After being engraved, the cylinder is polished, returned to the electro-plating bath to receive a very thin facing of copper, and again polished; it is then ready to be used for printing. Two formulæ are given for the baths.

Baths for electro-plating white metal print-rolls.

1.—Cyanide of potassium	..	..	..	500 grams.
Acetate of copper	..	..	..	350 "
Sal ammoniac	..	..	..	200 "
Water	..	..	..	25 litres.

Dissolve the cyanide in 20 litres of water, acetate of copper and the sal ammoniac in 5 litres water. When added together, the resulting solution should have the colour of white wine. If it has not, add more cyanide, and it is then ready for use.

2.—Sulphate of copper	..	..	..	350 grams.
Rochelle salts	..	..	..	1500 "
Caustic soda (50 per cent.)	..	..	..	800 "
Water	..	..	..	10 litres.

The white metal cylinder rests in the bath on convenient supports. Ten galvanic cells of the Bunsen, or other equivalent pattern, afford a sufficiently powerful current, and after the action has been continued for about a quarter of an hour, the current is broken, the cylinder lifted out, rubbed with finely powdered pumice stone, well washed, returned to the bath, and the electric current again closed. In from 15 to 18 hours, a large layer of copper from six-hundredths to ten-hundredths of a millimetre in thickness will be deposited, which has been found sufficient. The specific gravity of copper is 8.88, that of the white metal, 7. The internal diameter of the print-roll

deposited with the Mulhouse Society is 96 centimetres; its thickness 25 millimetres, weight 61.6 kilos. A similar cylinder of copper would have weighed 78 kilos, or about 19 per cent. more. The casting of copper which fuses at 1092° C., is more expensive than white metal, which fuses at 432° C., and taking into view these and other considerations, M. Depierre estimates the cost of a white metal cylinder to be in Europe 45 per cent. that of copper.

Manchester Chamber of Commerce.

FREE TRADE AND PROTECTION.



At the quarterly meeting of the Manchester Chamber of Commerce, the president (Mr. Gaddum) said:—"With regard to the question of trades marks, the directors had frequently impressed upon the Board of Trade the necessity of everything connected with registration being settled in Manchester, short of the final registration in London. Considerable inconvenience had arisen owing to a difference of opinion between the officials here and in London.

There were now three bills before Parliament—Mr. Mundella's bill, the bill introduced by Baron de Worms, and the Merchandise Marks Law Consolidation and Amendment Bill. Witnesses had been examined in London, and one of their directors (Mr. Hutton), a member of the Board of Trade Committee; and care had been taken that proper representations should be made whenever the turn of witnesses from Manchester came." Mr. Gaddum, after referring to the steps taken to prevent the "false marking of goods, and to the state of the law in India, which renders it most difficult to punish those who send out materials falsely stamped, suggested the advisability of attempting to bring about a change in this Indian law, by getting some clause introduced into the Merchandise Marks Law Consolidation Amendment Bill, which, if it was adopted in this country, might be copied into a corresponding enactment in India."—Mr. H. F. Hibbert then addressed the meeting, and moved "That with the view to encourage the more regular employment of labour at home, and to strengthen the relations between Great Britain, her colonies, and dependencies, the Chamber is of opinion that a comprehensive measure of fiscal reform is necessary, and recommends—1. The imposition of moderate tariffs for revenue purposes, on all manufactured articles from protected countries competing with our own industries, with a corresponding reduction of the burdens which bear so heavily on the mercantile community at home. 2. The abolition of all duties on tea, coffee, cocoa, chicory, and dried fruits, and the imposition of revenue duties of an equal value on wheat, barley, oats, rye, peas, beans, meal, and flour, from protected countries." Mr. Hibbert stated that "Free Trade" had as much to do with giving us the commercial supremacy which our country enjoys, as had the last *transit of Venus*, but the agencies which had been at work to produce these results, might be classed under three heads—first, that long before we were free traders, we were the greatest commercial nation the world ever saw; secondly, the energy and genius of our people, which developed in the substitution of steam for manual labour; and thirdly, the possession of India and our colonies. The doctrine of free trade was sound in theory, and it would have worked equally well in practice had every nation in the world been so beneficially created by Providence as to be able, each in its turn, to produce something more advantageous than anybody else. The exports of product and manufacture of the United Kingdom had increased during the last 16 years by 13½ millions, but not with foreign countries; on the contrary, it had decreased with foreigners to the extent of 12½ millions, while our trade with our colonies had increased £26,115,000. The Cape had developed its trade. India had increased from £19,000,000 to £29,000,000, and Australia had increased from £9,000,000 to £25,000,000. These figures proved that in the foreign and protected markets of the world we were losing ground. In our own markets, we were gaining ground, and yet, were it not for India and the colonies, the free trade bubble would long ago have vanished into thin air, never again to be reconstructed. Did protection enhance the cost of production, so as to make it impossible for the nation imposing the import duty to compete with the neutral markets of the world? Secondly, did the nation imposing an import duty under all the circumstances pay it? Those were the two cardinal axioms of

the Cobden Club, and on those axioms the whole structure of free trade was built. Destroy them, and they would destroy free trade. In his little way he was going to destroy them. He felt perfectly confident that in the long-run the principles he advocated would win. He submitted that statistics conclusively proved that protection did not enhance the cost of production so as to make it impossible for the nation imposing the import duty to compete in the neutral markets of the world, and that the nation imposing an import duty under all circumstances paid it. His remedy for the present condition of things was as stated in the resolution. The proposed change in the incidence of taxation would, he argued, redound to the great benefit of the English people, in that the agricultural industry would be improved, whilst the public would find that no real addition was made to their yearly expenditure on the articles of daily consumption.—Mr. W. A. Russell seconded the resolution, remarking that he was not connected with the Fair Trade League nor with any political party either inside or outside the Chamber. When the matter was previously discussed, he thought he showed conclusively that it was in vain to wait longer for other nations to follow England's Free Trade example. He contended that foreigners were not only prepared to keep England out of her own markets, but to shut her out of the so-called neutral markets if they had the least opportunity. While America had an embarrassment of riches, England, though a free trade nation, had an embarrassment of poverty, and President Cleveland told us distinctly that he would reduce taxation in order that they might keep up the tariffs and so retain their own industries. Mr. J. C. Fielden, said he would show that the statistics tabulated by Mr. Hibbert were misleading. To compare the produce of this country with that of the United States was simply a farce. If the table had been divided between raw material and manufactured goods, it would have told a very different story. At the beginning of another table, they were told that the cotton manufactures brought into this country had increased from £1,256,494 in 1870, to £2,471,658 in 1885. If Mr. Hibbert had taken the trouble to look, he would have found in the Board of Trade returns a column for foreign products imported into this country, and re-exported goods that simply called here. He had not paid the slightest attention to the re-exported goods. Mr. Hibbert and his friends were asking them to risk seventy millions of trade in order to preserve one million. Did they represent the working classes? What working men's association had asked them to take up this question? He (Mr. Fielden) was in touch with the leaders of labour and the great labour organisations throughout the kingdom, and he was not aware of a single meeting representing the working classes which had advocated Mr. Hibbert's theory. In reality, the value of the imported cotton goods did not exceed £1,000,000, representing in wages £200,000, and in order to secure that trade they were asked to submit to a tax on bread-stuffs equivalent to £300,000. With regard to the assertion that it was wrong to attribute the progress of this country to Free Trade, he would point out that other nations had had the advantages of railways, telegraphs, and improved machinery, and yet their industries had not developed to the same extent as ours had. Again, would Mr. Hibbert, and those who supported his views, allow Canada to send corn here free of duty, and at the same time levy a duty of 15 per cent on the wheat of the United States? What would the United States have to say to that? They were asked to begin a policy that was fraught with enormous danger to this country. They were asked to start on a career that would be fatal to that great colonial system of which we were so proud, a policy that would set us in opposition to every great nation of the world. This policy was, in short, not only unsound economically, but politically.—And they were asked to enter upon this battle of retaliation at a time when the great nations of the world were tending towards Free Trade. The State of Rhode Island had carried a Free-trader as the Governor of the State for the first time in its history, and he had the authority of the American Consul in this city for saying that in his (the Consul's) opinion the great majority of Americans, if polled on the subject, would declare in favour of Free Trade. The advantages of a Free Trade policy had been conspicuously shown during late years, because it was admitted that no nation in the world had passed through the last ten years of commercial depression with more comfort in general than Great Britain.

The Trade of the World.

[From Special Telegrams and Sources of News all over the World.]

A Colonel in Her Majesty's army, only just arrived home from Burmah, considers that there are immense trade openings in that country, and that they may just as well be taken advantage of and turned to good advantage now as at any future time. "It took us ten years," he said, "to pacify the Punjaub, and it will take very much the same time to perform a similar operation in Upper Burmah. As for the Dacoits, they create no serious alarm; they are merely people fighting, as they think, for their independence, but whose action exercises little or no influence on the general state of the country." This gentleman, who travelled from Mandalay with Sir Frederick Roberts, is of opinion that in that city a good deal might be done by enterprising British manufacturers.

A FOREIGN CONTRACT OPEN.—It may be of service to our readers to learn that the Bulgarian Government, whose headquarters are at Sofia, intend to give out a contract, on May 15, for army cloth, viz.:—1,410 metres of scarlet cloth, 70 metres of white, 90 of yellow, 320 of madder red, 2,000 of dark blue best quality, 320 dark blue second quality, 54,000 dark green, 5,950 blue grey, and 45,200 metres of grey cloth for cloaks.

GERMAN EXPORTS TO THE UNITED STATES.—A Hamburg correspondent says that the exports from Elberfeld to the United States during the first quarter of the year amounted to 2,427,600 marks, as against 2,026,250 marks in the corresponding period of last year. Silk, and stuffs mixed with silk, figure in this sum for 711,082 marks, woollen and mixed woollen stuffs for 336,178 marks, cotton, and mixed cotton goods for 103,944 marks, dyes and chemicals for 335,566 marks, and iron and steel goods for 756,960 marks.

NEWS FROM JAPAN.—The cotton manufacturers of Yamato have been alarmed by the fact that extensive sizing and scamped goods have largely diminished the demand for their goods. The large accumulations of silk in Yokohama, and the consequent embarrassment of dealers, are stimulating the cry for "direct trade." The Japanese have the erroneous idea that they can ship profitably themselves the produce which foreign buyers do not want. It is proposed to raise the capital of the Bank of Japan from 10,000,000 to 20,000,000 yen.

TRADE IN GREECE.—A woollen and cloth mill has been set up near Athens. The cotton industry at the Piræus is doing fairly well.

THE SHANGHAI SILK MARKET.—According to the latest report from Shanghai, the market for raw silks still continues dull, but holders refuse to submit to any reduction in price, and the few sales reported show no change in quotations. About 100 bales of Tsatlees have been taken at Ts.405 for red elephant, and at Ts.352½ for gold ki-lin. In Hangchows nothing is doing. As regards Taysaams, the settlements are only 10 bales of green kahings and 20 bales of 9 by 12 moss, at quotations. A parcel of 10 bales Shantung gold eagle, yellow silk has been placed at Ts.320. The arrivals, as per Customs returns, from March 1st to March 7th, were about 110 bales of white silks, 250 piculs of Yellow silks, and 30 piculs of wild silk. In re-reels, the purchases for the week's American mail were increased to a total of about 200 bales. Stocks of the lower grades are well nigh exhausted, and little is now offering below Ts.375 per picul. About 30 piculs of wild silk have been booked at Ts.120 for fair ordinary Tussur. As to waste silks, fine gum waste is wanted at Ts.110, and coarse gum at from Ts.86 to Ts.87, but stocks are almost exhausted, and arrivals from the country are small and infrequent. In Shantung pongees, the sales 2,000 pieces are reported at Ts.2.75 and Ts.2.95 for 25-26oz. goods. Purchases include:—Tsatlee:—Red elephant at Ts.405 per picul, large elephant I. at Ts.400, deer "vun-loh" at Ts.360, and gold ki-lin at Ts.357½; in Taysaams are included green kahings cicada I. at Ts.340, 9-12 moss, green horse II. at Ts.310; in yellow silk, Shantung gold eagle at Ts.320; in Tussur, raw fair at Ts.120; and in re-reeled Tsatlee, best chop at Ts.495, and Market III. at Ts.370.

COTTON GOODS AT GOREE-DAKAR.—With reference to the packing of cottons for exportation, it is said that—"Cotton goods are usually in packages twice too large and very badly fastened together. Such packages are also, generally, quite insufficient to protect their contents against wet, or even against a degree of dampness which does not amount to wet. Great unwieldy cases are not proof against any of the rough incidents which happen on voyages to countries where the facilities for handling and caring for such packages have not been developed. No match-box built case containing 2,000 yards of prints could be landed safely from a canoe after passing through a heavy surf, nor would the security be much greater if such a package had to be transported from a boat on the heads of natives to the top of a muddy river bank. Packages prepared in Europe are usually constructed with a view measurably to guard their contents against all accidents of the nature described, against slight showers even, and I have seen goods so nicely enveloped in oiled paper, and other coverings, as to be safe if immersed a considerable time in water. It is not necessary, I think, that I should go more into this subject of packing goods for export, although it appears one of great importance and worthy of immediate attention. The time is certainly at hand when the whole uncivilised world will afford the best markets for many articles which we are already anxious, but not well prepared, to export, and if the ground is not occupied shortly, it will at length have to

be done so under the overshadowing plant of a fierce competition. In England already, not only the shippers, but the manufacturers and bankers who back them, have a care for their goods until they reach the consumers near the head water of the Senegal, the Gambia, the Niger, the Congo, and the Zambesi. Nothing appears neglected by them which has the least tendency to ensure success."

CUSTOMS REGULATIONS IN ITALY.—The General Board of Customs, so says our Roman correspondent, announced the following regulation on February 17th:—Cotton textiles, with 12 per cent. of silk mixture, consisting partly of silk waste—the quality of the silk mixture not being considered—will come under section No. 127d. General duty, 3 lire; special duty, 2 lire 50 centesimi per kilo. Sewed leather straps for belting, if they come with machinery, not accompanied by a motor or the corresponding pulleys, come under 172a, the general duty being 75 lire per 100 kilos.

ROUMANIA'S RELATIONS WITH OTHER COUNTRIES.—The Roumanian Chamber has authorised, says our Bucharest correspondent, the government to prolong the provisional treaty of commerce with France until the end of the year, and to conclude provisional treaties with other States for the same period, but on the basis of the new treaties as regards agriculture and the exportation of cattle and corn.

LACE AND TEXTILE GOODS IN GERMANY.—A correspondent, writing from Plauen, states that it is intended to erect there shortly an important English curtain and lace manufactory. An older curtain manufactory will form the basis of the concern, backed by a company. There is a good deal of available plant already on hand.

REVIVAL OF TRADE IN CAPE COLONY.—Sir John Gordon Sprigg, Premier and Treasurer of Cape Colony, speaking at Worcester, declared that the financial position of the colony was better now than at any period during the last five years, the trade returns showing that the corner had been turned, and that a term of prosperity was commencing. The Premier further stated that there were cheering prospects of an equalised revenue and expenditure.

THE MANUFACTURE OF SILK IN THE UNITED STATES.—The United States Government intends protecting the cultivation of silk in the Union, and the requisite appliances have been prepared and arrangements made to this end by the Department of Agriculture in Washington. According to the figures available, the silk imports into the States in the year 1885 amounted to \$20,000,000 worth.

LINEN THREAD IN RUSSIA.—A Warsaw correspondent says that the increase in the duty on linen thread imported into Russia, which is expected to be declared shortly, will principally affect England, whence the Russian market has been hitherto for the most part supplied. At the present moment, three important English firms have large stocks lying in Warsaw.

THE JUTE TRADE IN GERMANY.—We learn from a Berlin correspondent that a meeting of jute manufacturers was held a few days ago in Berlin, at which it was resolved to renew the union for maintaining list prices, the term of which had expired. It was also stated that the works were fully employed, and it was agreed to make no change in the recent prices except as regards hessians, for which a reduction of about 1½ per cent. was declared, owing to the reduced price of raw jute.

Consular Reports.

A FLOURISHING YEAR IN ECUADOR.—Mr. Consul Chambers, of Guayaquil, has the pleasing duty of reporting that the commerce of the Republic of Ecuador in 1886 was "unusually flourishing" attributable to the large crops of cocoa and other produce, and consequent activity of other branches of trade. Money was plentiful, and the increased desire for investment resulted in the establishment of several new enterprises throughout the Republic.

THE TRADE IN PERSIA.—In a report on the trade and industries of Persia to the Foreign Office, Mr. A. Nicholson writes:—Among the imports to Ispahan and the Southern part of Persia, England, and especially Manchester, occupies the first place, and the trade is mostly in the hands of English firms, although some Persians have of late established themselves in England, whilst others obtain their goods direct from that country through their agents. The greater part is, however, imported by English houses established in Persia. Importers have passed through some years of bad trade, owing to partial failure of crops in 1884 and 1885 and to excess of imports. A great improvement might take place if more security were offered to the trade, by strict commercial laws being introduced. Manchester manufactured goods form the chief part of English imports to Ispahan, and they may be roughly put down at 8,000 to 10,000 bales per annum, in which Messrs. Ziegler, Hotz and Muir, the three English firms established in Ispahan, import 5,000 to 6,000 bales. The following class of goods chiefly constitute the imports:—1, prints, jacconetts; 2, grey shirtings in 8, 9, 10, and 11lb. weight; 3, grey Mexicans; 4, white shirtings; 5, white cambrics; 6, grey and dyed yarns; 7, white mulls; 8, red turkey twills; 9, handkerchiefs. The average wholesale value in Ispahan of one bale of prints (25 pieces) is about 60 tomans (£20), and of grey shirtings from 30 to 40 tomans per bale. Prints and twills are chiefly used for men's and women's clothing, curtains, etc. Grey twills are partly dyed

and partly used in the grey state. This article furnishes the clothing of the poor people. Grey and white shirtings are largely used for printing ("kalemkars"), which forms one of the chief industries of this place. The imports from other countries are small as compared with those of England. Germany and Austria send woollen cloths, partly direct and partly through Constantinople. Cloth is not much imported from England, because it is dearer than Austrian, but if second-class cloth were imported a good trade might be done. The reason of this is that every Persian, however poor, tries to buy himself a new coat at the new year, and so he does not much care how inferior the stuff is, provided it will last him out the 12 months. Switzerland sends handkerchiefs and red Turkey twills, and Russia, loaf sugar and brass ware, such as Samovars, trays, &c. This latter country has, of late, made strenuous efforts to push their piece goods trade with Persia, but, although it has affected the trade in the north, it has not, as yet, made any impression on the south.

TEXTILE GOODS IN EGYPT.—Referring to spun and woven goods introduced into Alexandria in Egypt, a foreign consul at that place directs attention to the following principal articles, viz.:—Red and grey sewing thread, which at present comes mostly from France, and is sold retail in Alexandria at 1f. per dozen reels, the largest importers of this article being the firm of Mohammed Ali and Co., in the Persian Bazaar; shoemakers' thread, which comes chiefly from Glasgow, costing at the place of manufacture 72s. the gross, and sold at Alexandria at 0·75f. per reel, the greater part of it being imported by Messrs. Marcus and Co., of Alexandria and Cairo; sewing thread of various colours, which is imported principally from France, being sold retail in Alexandria at 1f. per dozen balls, the most extensive importers being the firm of Mohammed Ali and Co., in the Persian Bazaar. The total annual value of these imports amounts to 225,000f.

TEXTILE GOODS IN TURKEY.—The head dragoman of the Belgian Legation in Constantinople has made a report respecting the importation of textile fabrics into Turkey. According to this report, the trade in spun and woven goods and hosiery represents two-fifths of all the foreign goods imported as far as Turkey is concerned. The total annual imports appear to run to £20,000,000 (Turkish)—say 500,000,000f.—of which upwards of 200,000,000f. represent the value of spun and woven cotton, wool, flax, silk, and hosiery imported into Turkey. These articles, therefore, forming the bulk of the imports, demand the special attention of manufacturers. Some months ago, the Turkish custom-house thought of publishing a tabulated report of the trade that had been done in the last five years; but although such a report was printed, it was never published. The bulk of this trade is in the hands of the English and Austrians. Belgium also contributes to it, but only a very small proportion, which is estimated at 750,000f. The relative commercial importance of the principal towns in the Ottoman Empire on a percentage is as follows:—Constantinople 33 per cent, Smyrna 18, Salonica 13, Beyrout 11, Bagdad 6, Alexandretta 4½, Djedda 3, Trebizond 2½, Tripoli in Barbary 1½, Crete 1½, Prevesa 1, Adrianople 1, Scutari in Albania 1, and Erzeroum 1½, per cent.



ODDS AND ENDS.

It is proposed to build a Technical School in Bolton, in commemoration of Her Majesty's Jubilee.

We notice that the eminent firm of Sir Edward Green and Son, have erected one of their Patent Fuel Economizers in conjunction with the steam boilers at the Royal Jubilee Exhibition.

A proposition has been laid before the Farmers' Alliance in Dallas, Texas, to raise 5,000,000 dols., with which to build cotton and woollen mills to be owned by the Alliance. The membership of this body is put at 235,000, and it was thought, by those suggesting the new departure, that a sufficient number of them would subscribe 20 dols. apiece to start the undertaking with 2,000,000 dols. capital, leaving the remainder to be eventually obtained. The success of the organisation in building a large number of flour mills seems to foreshadow active steps in the erection of cotton and woollen mills, in which the members are more interested.

Earl Granville, at the opening of the Free Library, Hanley, referred to the subject of foreign competition, and said that complaints had been made that the British Government did not show the same care to push the interests of home trades as was exercised by some foreign governments, but he would point out that it would be disastrous to the government to try to push the special interests of particular trades. But it was desirable, where undue pressure was exercised on behalf of any foreign competitor, that British representatives abroad should take all honourable and energetic means to put Englishmen upon a firmer footing with their foreign rivals. With regard to obtaining information on commercial subjects by consular authority, progress in this direction was now being made.



Receiving Orders.

Elliott, W. (trading as Elliott and Co.), Woodchester Mills, near Stroud, Gloucestershire, woollen cloth manufacturer, Gloucester Court.
Wallis, T. S. (trading as Thomas S. Wallis and Co.), 12, Ramsden Street, Huddersfield, woollen merchant, Huddersfield Court.

Adjudications of Bankruptcy.

Brown, J., Gregson, D., and Trafford R., Blacko, Lancashire, cotton manufacturers.
Duckworth, W., Duckworth, G., and Duckworth, J., Canal Mill, Church, near Accrington, Lancashire, cotton manufacturers.
Goulden, R., and James, R. H. (trading as the Seedly Printing Company), 22, Dickinson Street, Manchester, calico printers.
Jacques, J., and King, R. R., 30, Charles Street, Bradford, worsted manufacturers.
Loewenstein, J. J. (trading as Jules J. Loewenstein), formerly trading at 49, now 47, Stoney Street, Nottingham, lace manufacturer.
Race, G. R. (trading as Race and Co.), Leeds, Yorkshire, cloth manufacturer.

Dividends.

Sackville, A. (trading as the Harpurhey Printing Company), Harpurhey Print Works, Harpurhey, near Manchester, dyer and calico printer, 3s. 4d. (first and final), 69, Princess Street, Manchester.
Swanwick, P., 41, High Pavement, Nottingham (lately trading with Albert Cutler, as Cutler and Swanwick), lace manufacturer, 2s. 0d. (first and final), Official Receiver's Office, 1, High Pavement, Nottingham.
Ward, M. (trading as Richard Ward and Sons), Ings Mills, Batley Carr, Dewsbury, woollen manufacturer, 5s. (second), Balme Mills, Liversedge, Yorkshire.

Dissolutions of Partnership.

Brown, J., Gregson, R., and Trafford, R., Blacks, Lancashire, cotton manufacturers.
Elson, T., and Balstone, A., 24, York Street, Manchester, fustian manufacturers.
Johnson, J. N., and Wilson, A. E., Perry's Factory, Ratford Boulevard, Nottinghamshire, lace manufacturers.
Ledgard, W. B., Stables, M., and Ellis, J., King Street, Leeds, Yorkshire, cloth manufacturers and merchants.
Taylor, J., Taylor, J. W., and Taylor, F. H., Gate Head, Greetland, Halifax, Yorkshire, woollen manufacturers.
Turner, H., and Wilson, W. H., Portland Street, Manchester, calico printers.
Winterbotham, A. B., and Peto, F. K., Cam Mills, near Dursley, Gloucestershire, woollen cloth manufacturers.

PATENTS.

Applications for Letters Patent.

Automatic motion for stopping looms. E. Smith, Bradford.	27th April	6,126
Brushes and rollers for cut pile fabrics and machinery. T. Schofield and F. Barker, Cornholme.	29th Mar.	4,651
Bobbin net or twist lace machines. A. C. Henderson, London.	30th Mar.	4,762
Belts for driving machinery. M. Grandy, Liverpool.	2nd April	4,912
Belt pulleys or drums, and method of manufacture. A. B. Perkins, Bradford.	6th April	5,156
Bleaching fibrous materials. J. and F. M. Gibson, Edinburgh.	13th April	5,359
Band for driving spindles and grooved pulleys for spinning, twisting, &c. W. Taylor, Halifax.	16th April	5,555
Brush for dressing and preparing silk. F. Fleming and J. Garside, Halifax.	23rd April	5,926
Construction and covering of textile printing rollers. T. Briggs and E. Webb, Manchester.	1st April	4,856
Cleaning and separating cotton waste, &c. H. A. Davies, London.	2nd April	4,945
Connecting the ends of driving belts or straps. T. Brown, London.	22nd April	5,879
Combined fulling and washing machines. E. Kempe, London.	23rd April	5,961
Carbonizing fabrics and fibres. E. Schorah, Halifax.	26th April	6,054
Construction of fallers and method of attaching gills. J. C. Horsfall, Bradford.	27th April	6,124
Drying apparatus connected with warp sizing machines. R. Gledhill, Bradford.	7th April	5,175
Drying pile and other woven or felted fabrics. H. Lister, Halifax.	21st April	5,818
Driving apparatus for rendering the speed of driven mechanism as uniform as possible. A. Gray, London.	22nd April	5,905

Drying cotton and other fibrous materials. J. D. Sutcliffe and B. T. O'Brien, Manchester.	28th April	6,208
Embellishing textile fabrics. T. Stevens, London.	31st Mar.	4,833
Electricity—application of—to the treatment of vegetable fibres. W. B. Watson and J. J. Worswick, London.	5th April	5,039
Figured cloth. D. Greenhalgh, London.	18th April	5,618
Healds for weaving. J. Parkington, Manchester.	4th April	4,972
Indicating or calculating and stopping the motion of looms. J. Fletcher, Ashton-under-Lyne.	14th April	5,415
Jacquard multiplying apparatus. F. Planchion, Manchester.	23rd April	5,912
Laces and machinery. J. Halliwell, Manchester.	31st Mar.	4,806
Loom shuttle tongue skewers. E. Booth, Manchester.	4th April	4,968
Looms. J. Matthieson, Manchester.	14th April	5,407
Looms. T. Valentine and J. Hunter, Belfast.	18th April	5,592
Looms. W. H. Hacking, Manchester.	23rd April	5,915
Looms for weaving gauzes of dhooties. J. Turner, Halifax.	23rd April	5,929
Lace curtain and window blinds. J. F. Forth, London.	23rd April	5,939
Multiple ply fabrics. H. Hardwick, Manchester.	30th Mar.	4,726
Measuring cloth. J. L. Stewart, S. Greenwood, and J. Overend, Bradford.	7th April	5,163
Mechanism for looms, parts of which are applicable to analogous purposes. J. Ashworth, London.	20th April	5,737
Motion of loom for weaving fabrics with various colours of wefts with two or more shuttles. J. Allan, Dundee.	22nd April	5,855
Oil cans, &c. W. W. Oldfield, Glasgow.	5th April	5,028
Pressing cloth, &c. J. Longtain, Leeds.	30th Mar.	4,742
Preparing or gill boxes. W. Gawthorp and J. Reddihough, Bradford.	31st Mar.	4,793
Polishing, brushing, raising yarns or fabrics. C. Benns, Manchester.	31st Mar.	4,739
Picker and shuttle cushioner. J. H. Paige, London.	1st April	4,895
Preparation of vegetable fibres. R. H. Collyer, London.	6th April	5,097
Preparing fibres for spinning. W. Clissold, London.	6th April	5,148
Preparing frames. S. Dyer, Belfast.	7th April	5,160
Picking Bands, and other bands or straps for looms. J. Forrest, and J. Dawson, Blackburn.	9th April	5,239
Presses for compressing yarns, &c. T. Coleby, Manchester.	18th April	5,593
Printing machines for calico. J. Kerr and J. N. Wilson, London.	19th April	5,711
Pressing and finishing fabrics. T. Holroyd, London.	25th April	6,023
Pressing fabrics. T. Holroyd, London.	25th April	6,324
Process and machinery for the mechanical debavage or cleansing of cocoons after brushing. E. W. Serrell, Paris.	27th April	6,121
Pickers for looms. W. Atherton, Bradford.	28th April	6,191
Rugs, mats, &c. E. A. Packer, London.	12th April	5,275
Regulating the tension of warp threads in lace machines. J. Jardine, London.	14th April	5,447
Shedding motion for looms. J. and E. Horrocks, Bradford.	29th Mar.	4,640
Scouring and washing wool, &c. J. and W. McNaught, London.	6th April	5,150
Stretching, airing, liquoring, &c., fabrics. D. Stewart and D. Walker, Glasgow.	6th April	5,113
Smoke consuming apparatus. J. W. Hartley, Stoke-on-Trent.	7th April	5,161
Sizing, dyeing, wringing hanks of yarn. J. M. Hampson, Manchester.	7th April	5,170
Stamping and embossing. G. Valiant and J. Nesbit, London.	12th April	5,299
Shuttles. D. McGregor, Glasgow.	15th April	5,495
Shuttle tips. J. Sellers, Manchester.	16th April	5,558
Stamping bosses for stamping piece goods. J. Bloor, Manchester.	20th April	5,744
Treatment of vegetable fibres. W. B. Nation and J. J. Worswick, London.	5th April	5,041
Treatment of fabrics composed of, or containing, silk, for improving their appearance. H. H. Lake, London.	7th April	5,205
Towels and towelling. G. W. and E. Wilson, and F. Nelson, Manchester.	9th April	5,220
Textile fabrics and apparatus. H. H. Lake, London.	16th April	5,577
Wool combing. W. R. Hamilton, London.	30th Mar.	4,769
Washing wool, &c. D. and H. Smith, Bradford.	4th April	4,981
Waterproofing fabrics. N. Dubois-Mauduit, London.	12th April	5,315
Woven fabrics. W. E. Gedge, London.	19th April	5,662
Warp lace machine apparatus. J. Woolley, London.	19th April	5,672
Worsted yarns. W. P. Thompson, Liverpool.	19th April	5,686
Weaver's reed book. J. Clayton, Preston.	27th April	6,129

Patents Sealed.

2,970	3,365	3,415	4,253	4,032	4,109	4,208	4,404
6,988	10,114	16,416	16,596	16,878	4,319	4,691	10,026
16,970	2,477	4,501	4,669	9,491	16,412	15,868	4,258
4,713	4,844	4,900	6,895	300	4,887	5,232	435
2,226	2,778	5,307	5,309	5,568	487	8,249	16,973

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EMINENT TEXTILE MEN. No. 8.

Lemuel Clayton, Esquire.

Our portrait of eminent textile men, issued this month, is that of Mr. Lemuel Clayton, the head of the firm of Clayton, Marsdens and Co., Wellington Mills, Halifax, silk spinners. Mr. Clayton's career is not remarkable so much from any wide celebrity gained, or conspicuous position won, as from a plodding progress from the poverty amidst which he was born, and the disadvantageous conditions of his early life, to the position which he has attained in the commercial world. His "story of life" is that of hundreds of others in the active counties of Lancashire and Yorkshire particularly, and of Great Britain generally, that of having been born under circumstances not admitting of any education in early life, the want of which has proved a constant drawback upon his efforts and chances in the race, both as regards mental and material progress, but it must be said that, in Mr. Clayton's endeavours to raise himself above the position in which he was born, he has not neglected the walks of science, art, and literature. An active life in the commercial world, however, has narrowed his opportunities in the higher branches of knowledge, and we bring his name before our readers more particularly as an example of what plodding industry can accomplish, under very disadvantageous conditions. Mr. Clayton was born in the township of Sowerby, near Luddendenfoot, at a period when railway enterprise was in its babyhood, and the opening of the Manchester and Leeds railway, through that district, was causing widespread talk and excitement amongst the country people, who flocked from their hill-side homes to marvel at the new means of conveyance—"puffing billy,"—which shot through the air at the rate of twenty miles an hour. It was at a time just far enough back to include a recollection of the miserable days of hand-loom weaving, and of the combing of wool by hand, both generally conducted at the worker's own home. Mr. Clayton's experience, therefore, comprises a period of history, as regards textile manufactures, remarkable for its progress—a period which has seen the crude appliances of half a century ago supplanted, step by step, by the marvellous mechanical contrivances of to-day. Our purpose is, however, to give a brief outline of his career. While he was but a

child, his parents found it necessary to leave the small farm at Thorphouse, and remove to Halifax, his father, Henry Clayton, trying other means besides that of a hand-loom weaver to support his increasing family. Two elder brothers had to start work at an early age, and at about seven or eight years old, the subject of our sketch was packed off to the mill as a cotton winder or piecer. It was under a small cotton doubler, who rented a garret in the old Stone Dam Mill, close by the extensive premises now occupied by Mr. Clayton's firm. He started life as a worker at a period when unscrupulous employers and needy parents could connive at the then lax provisions for the regulation of labour in factories, and children not eligible to work at all were kept in the mill the full factory hours—six in the morning to half-past seven at night. At these tender years, it was Mr. Clayton's lot to work full time, and he relates that more than once he remembers being hidden away in a skip when the rare visit of the factory inspector took place. It was about this time that Lord Ashley was making his praiseworthy efforts to awaken public opinion, and rouse the legislature to a sense of the scandalous abuses and hardships prevailing in factories and mines as regards the employment of women and children. Mr. Clayton was, therefore, deprived of what little benefits even a "short-timer" may obtain from the brief half-day school experiences. After a few years' residence in Halifax, his father obtained a situation as warper for a cotton doubler at King Cross Mill, and the family removed to Trafalgar. Mr. Clayton held various situations as winder, piecer, warper and warehouseman under the same employer, but he was anxious to get out of the mill to something better, and he sought the means of acquiring an education to fit him for the "something better." This was about the time of the Chartist agitation in 1848, and a few working men had banded themselves together, partly with political aims, and partly for mutual improvement in reading, writing, etc. Their studies were conducted on week nights and on Sundays, the better informed taking charge of classes in arithmetic, writing, grammar, etc.; classes, too, for the study and practice of music and elocution were conducted, and even more ambitious fields of learning were attempted. The advantage gained in this humble educational effort, proved the turning point in Mr. Clayton's career. He had learnt to read, to write, had attained some proficiency in arithmetic, and was able to speak by grammatical rules, and factory life was more and more irksome. He made several unsuccessful attempts to get a situation more to his liking, and at last succeeded in obtaining one in the warehouse of a firm in Halifax engaged in worsted spinning and the manufacture of damasks. The position he took under his new employers was but a menial one at first—that of warehouse sweeper, porter, and piece roller—and they paid even less than he had been receiving in the factory. But that was not so much a consideration, though inconvenient, as there was a field for advancement here which could not be hoped for in the factory. This change was made in 1851, the year of the first great Exhibition in London, to visit which Mr. Clayton had a strong desire, but the pinch of poverty did not admit of his raising even the 5s. for a day trip—the rate at which people were conveyed to and from London and Halifax. It was a sore disappointment, and possibly lost him an opportunity of gaining useful knowledge. About this time he lost his father, and a widowed mother and young family depended largely upon his efforts. These and many other disadvantageous circumstances would have disheartened most young men, but they seem to have imbued Mr. Clayton with a stronger determination to throw off the yoke of poverty. His progress as an employée in the damask trade was rather rapid, for less than ten years saw him through the positions of maker-up, taker-in, pattern-man, manager, salesman, and market-man, to that of traveller for the house. In these various posts he had acquired a knowledge of wool, worsted yarns and piece goods, as well as a taste for colour and design. These qualifications proved of great service to him as traveller, often enabling him to aid in carrying out a customer's ideas, and to originate novelties himself in fabrics and design. "Words cannot describe," says Mr. Clayton, "the joy I felt when (about 1860) I first received intimation that I was to be entrusted with the important post of traveller, and I turned my face towards Scotland (my first field), green in experience of the "rules of the road," but strongly impressed with the idea that this was the opportunity of my life—an opportunity which at once placed within my reach a wider knowledge of commerce, a more extended opportunity of studying men and things, and of gratifying a long-cherished desire to see the interesting places and great centres of population of my native land. Ten years "on the road" as a "commercial" I consider is a life in itself, though fraught with much risk. It is a great school, combining more varied experiences and greater temptations, perhaps, than any other calling." Mr. Clayton held the position of traveller about ten years, during which time his income gradually increased, and this, in part, was devoted to improving his home, and procuring schooling for the younger members of the family, and getting them into better positions. In not a few cases, outside the pale of his own family, we believe Mr. Clayton has extended a helping hand. In some cases, he has been sorely disappointed. In one, that of a friend in London, to whom he advanced a few hundred pounds to help on a coal tar distilling business—appearances were such that it looked as if fortune was about to smile upon him, for his share of the profits for a year or two were splendid from such a small business. Extensions were made, and it began to look sufficiently encouraging to tempt him to put his whole capital and efforts into it. A taste for the science of chemistry, and some practical

knowledge of this particular branch would most likely, at this period of Mr. Clayton's life, have led him into quite another field of enterprise than that of the silk trade, for it was at a time when the manufacture of aniline dyes was in its infancy, and before the more important and valuable colour-yielding properties of coal tar were discovered—discoveries which have since proved sources of enormous wealth. As it was, circumstances rendered it necessary that he should acquire some knowledge of this business, for success had “turned the head of his partner,” and led to extravagances in his management and mode of living, so that, to save himself, Mr. Clayton had to “take the bull by the horns” and get rid of him. Thus he had a business which he little understood, and had less liking for, suddenly thrown on his hands. But he had learnt that it was a profitable business, and set to work to organise it according to his own ideas and plans under a trustworthy man who had been, up to this time, a foreman. This had to be done chiefly by correspondence, as Mr. Clayton's time was taken up in his duties as a traveller, and thus he contrived to pull the business together again, and succeeded in making a nice little sum of money out of it before he gave it up. About this time, too, he was called upon to give a helping hand, financially, to a few working men who had started a small concern as silk spinners in Brighouse and were in difficulties. This step led him to look into the nature and prospects of silk spinning, and though he did not lag in pushing on his Deptford chemical trade for the sake of its profits, yet a strong liking for the silk business sprung up as he became more acquainted with it, and the profits of the chemical drifted for a few years into the silk business, until his interest in it was of so much importance as to warrant him in resigning his situation as traveller, selling out his chemical business, and embarking his whole capital, time, and talents in the concern which has grown, in a few years, from being one of the smallest, to rank among the largest of its kind in England. He has not been contented to follow in the old grooves as to the treatment of waste silk; indeed, he was scarcely acquainted with them when he began to take an active part in the business, but his knowledge of fabrics generally enabled him to suggest, in many cases, ideas which have made trade for others, and opened up new outlets for spun yarns, thus creating a want for that which he was ready to supply. Several unknown classes of silk waste have made their appearance in this country since Mr. Clayton joined this firm, and true to the spirit which has marked his career—that of progress—he lost no time in studying their qualities, inventing suitable methods of treatment, and opening up markets for the yarns, for it must be said that he was the moving genius of the factory, as well as the traveller and salesman for its products. At least two of the comparatively new and unknown classes of waste introduced within the last ten or twelve years were first manipulated by Mr. Clayton's firm. Both were importations from China—one, Tussur, or “stinking Tussur,” has a peculiar history. A large consignment of this material arrived in this country on the chance of finding a buyer. It had been hawked about the market pretty freely, and spurned by spinners generally, as “of no use,” and the owner was “sick of it,” for the inhabitants in the neighbourhood where it was stored, were loud in their complaints of its smell, and an action for nuisance was threatening at the time Mr. Clayton came across samples of it in a Manchester broker's office. He thought there was “something in it,” and desired to have the samples sent on for experimental purposes. Some progress was made with these specimens, and 100 lbs. were ordered to be taken from various bales. As in many similar cases in this and other industries, the “right way to do it” was not found out all at once, but it was discovered, and the result was the production of a beautiful bright fibre of a brown colour, the natural colour of the silk. At that time, white mulberry silk was being largely used in the sliver for mixing with white mohair, in the Bradford trade. It had occurred to Mr. Clayton that the natural colour of this silk was very nearly that of brown mohair, and that something new might come out of mixing the two together. He waited upon a late member of the firm of Sir Titus Salt, Sons and Co., with a sample, and explained his ideas, and so favourably impressed was Mr. Salt, that he ordered a few cans of the sliver at once, asking if there was “much of the material to be had.” A further and larger quantity was ordered, and Messrs. Clayton and Co. were strongly advised to secure all there was on the market. It was a large venture for a small firm to make—55,000 lbs.—but it was secured to the delight of the seller, in the sense of having found a buyer, but it proved “a sad losing game” to him financially, inasmuch as instead of realising from 1s. 6d. to 2s. per lb., as expected, it was cleared out at 6½d. The working of it promised to yield a handsome profit, and “we had,” says Mr. Clayton, “got fairly to work, delivering hundreds a week, when one morning instruction came to stop making any more,” a hitch had occurred as regards the cloth Messrs. Salt were bringing out. It proved a failure, and we had a warehouse full of raw material on our hands. “Necessity is the mother of invention,” and the firm were driven to find a use for this material in other quarters. Many things were thought of, and tried. Some little success had attended some of them, when the attention of the late Mr. Bottrill, of Skelmanthorpe, near Huddersfield, was drawn to it, and it struck him, as a most suitable silk for pile fabrics, and he set to work experimenting, the result being that he took out a patent for making imitation silk seal skins from Tussur silk, and since that day, this beautiful fabric has taken such a hold on the public that the price of the raw material has more than quadrupled the figure at which he

bought the first importation. Mr. Clayton claims also to be among the first, if not the first, to find out the brilliancy and fineness of the fibre of Punjum silk, and its proper treatment. His first purchase of this article was under 2s. per lb. and at a time when few, if any, would look at it. To this silk is largely due the great success of English plushes over foreign makes, and the importations of it, during the last few years, have grown enormously. To Mr. Clayton's mechanical skill is due, in some measure, the success of his firm. One of his inventions, a contrivance for cleaning yarn, was challenged by Mr. Lister, of Bradford, as being an infringement upon a patent he had purchased and was working so successfully that spinners, not resorting to that, or some other method of cleaning yarn, were threatened with the loss of their trade. A friendly compromise, was, however, made quite satisfactory to the firm, and very easy terms were afterwards arranged for the working of “Prince's patent” by other spinners. From the above notice, it will be seen that Mr. Clayton's experience in the manufacturing world is a very wide one, embracing, as it does, a knowledge of cotton, worsted, and silk, and he is entirely indebted for his success in life to his energy, perseverance, and determination to succeed in raising himself to a position greatly above that in which he was born. He is a Liberal in politics, and a thorough going Free-trader. During the last few years, he has been able to indulge, in some measure, his long cherished desire to see other countries and other people. In 1880-81 he made a tour in America and Canada, along with two well known Bradford gentlemen. This tour occupied about five months, and covered the greater part of the North American Continent. Mr. Clayton's letters (published in the *Halifax Courier*), proved very interesting reading. His next tour of importance was through Italy and to Egypt, immediately after the battle of Tel-el-Keber. His graphic descriptions, published in the same paper, of the three months' travel were widely read and spoken of. But his last journey, that of a tour round the world, was his greatest effort in this way, and comprised Italy, Egypt, India, Ceylon, the Straits Settlements, Hong Kong, various cities in China, and in and about Japan, and a second run through America (taking a more southern course), a journey which was accomplished in about eight months, and compassed a distance of more than 30,000 miles. He wrote over twenty long and highly descriptive letters, these were published in the same paper, and were so thoroughly appreciated that many of Mr. Clayton's friends have expressed a strong desire to see them in book form, for they display a subtlety of observation, an industry of application, and a power of description, indicative of a mind of no mean order. Mr. Clayton never had a “hankering” after public positions or honours, but, in his earlier life, he devoted time and services to movements calculated to improve the position of the working classes, such as the Halifax Flour Society, the Halifax Co-operative and Industrial Society, the Halifax Permanent Benefit Building Society, etc., in the early days of their history. Recently, he was unanimously elected to a seat in the Council of the Halifax Chamber of Commerce, and last November the Central Ward sent him by a large majority as its representative in the Municipal Council. Just as we go to press, we learn that Mr. Clayton has undertaken to relieve the somewhat threatened dearth of Jubilee celebrations, in his native town, by providing a well executed memorial medal in bronze for each scholar attending School Board Schools, about 10,000 in all, and also aiding in the movement for providing a tea and entertainment for old people.

The Manchester and the Yorkshire Exhibitions.

The Exhibitions now open at Manchester and Saltaire, are proving great sources of attraction to thousands of visitors daily. In our last issue, reference was made to many of the exhibitors in the machinery sections at both places; whilst we dealt at some length with the great variety of fabrics on view in the various departments, we inadvertently omitted to mention the really excellent display of silk brocatelles, tapestries, and other fabrics, made by Messrs. Cowlshaw, Nichol and Co., of Manchester, at their Stand close to the Central Fountain. The case will amply repay the inspection of those interested in these fabrics. In this issue, we have reserved a considerable number of our pages to descriptions of some of the machinery on view at the exhibitions, which we have no doubt will be interesting to our readers.

The Manchester Jubilee Exhibition.

MESSRS. W. AND J. GALLOWAY AND SONS, MANCHESTER.

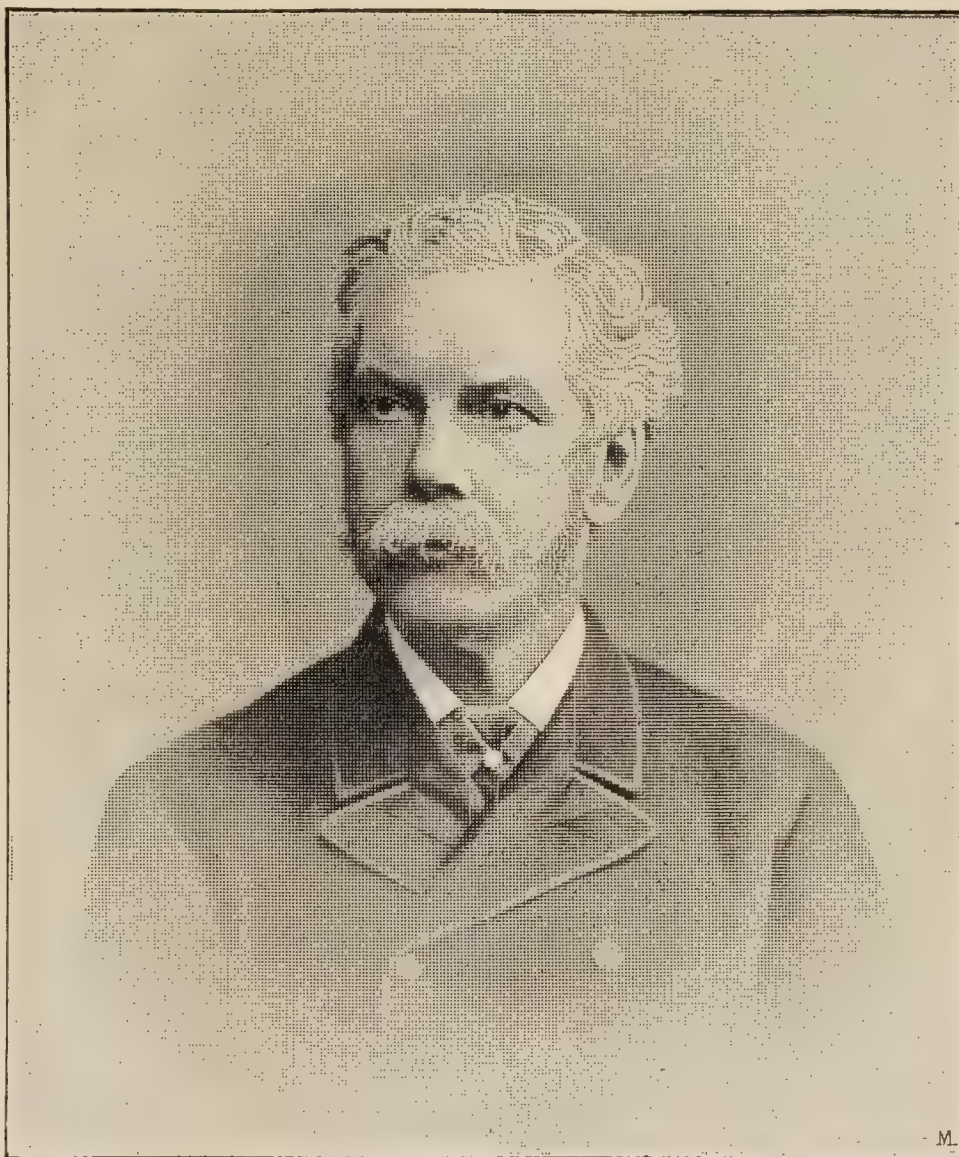
The engraving on the next page is a “counterfeit presentment” of Mr. Charles John Galloway, the Vice-President of the Committee of the Royal Jubilee Exhibition, which is now running so successfully at Manchester. He is the son of John Galloway, who, with his brother William, founded the firm of W. and J. Galloway about the year 1830. Soon after 1850, the sons were admitted into partnership, and the present title of the firm was adopted at the same time. Mr. Charles Galloway was apprenticed to the engineering business, passing through the various workshops, and has since been associated with all the great undertakings of the firm. He has, for many years past, taken an active part in the management of the establishment, his name being connected with nearly all the patents taken out by the house. In addition to the calls upon his time necessitated by the large connection which the firm enjoys, and the labour entailed by the Vice-Presidency of the Exhibition Committee, Mr. Galloway is a magistrate of the City of Manchester, a member of the Ship Canal Committee, under the presidency

of Lord Egerton, of Tatton, which promises to bring this most important scheme to a successful issue; he is also the chairman of the Boiler Insurance and Steam Power Company—the largest association of the kind in existence, and a director of the Mutual Fire Insurance Company. Messrs. Galloway have always taken a prominent part in exhibition work, and have supplied power to every important exhibition of recent years. We may mention Vienna, Philadelphia, Paris, the London series, Bradford, Huddersfield, Crystal Palace, and Liverpool, in every case providing boilers for driving the engines, and frequently the engines themselves, always receiving the highest award. At the present Manchester Exhibition, they have lent ten Galloway boilers, which provide all the power required throughout the Exhibition. This is the finest range that has ever been put down for driving any Exhibition, and the power developed is enormous. The boilers are 30 feet long by 8 feet diameter, made throughout of the well known "Dalzell" steel plates, made by Messrs. Colville, of Glasgow, $\frac{3}{8}$ of an inch thick in the shell, which is butt-jointed, with four rows of rivets, and two strips, the other parts being strong in proportion. Complete sets of fittings are also provided, including scum apparatus, Deadweight and Hopkinson's valves. The boilers are set in brickwork in the ordinary way, but instead of being in a separate house, they are built level with the floor of the machinery annexe, and the fronts come into this annexe, so that visitors are able to walk straight up to and inspect them. From the front of the boilers to the roof is carried a glass screen to keep the heat from spreading into the room, which would be decidedly inconvenient in the coming summer. Each boiler is calculated to evaporate 8,000 lbs. of water per hour, which is equal to 400 indicated horse, with an ordinary condensing engine, so that the total force is 4,000 indicated horse. Each boiler weighs, without fittings, over 20 tons, and the pressure under which they work is 100 lbs. to the square inch. Messrs. Galloway also provide the complete plant for the fairy fountains. Fountains on a similar principle were provided in London, at the Colonial Exhibition (Messrs. Galloway worked them), and proved an immense attraction throughout the entire season, the space surrounding them being always packed. But the Manchester fountains, which we shall now describe, are very much more extensive, having larger basin, throwing three times as much water, sending this water to a greater height, and having extra effects. The water at the London Exhibition was forced up by the natural pressure from the mains, but Old Trafford lies high, and little pressure can be got in this way, so that special engine and pumps had to be put down for the purpose, and the same water is used over and over again as long as it remains clear and sweet. The engine is on the compound principle, having the high pressure cylinder, 14 inches diameter, placed over the low pressure, 24 inches diameter, both with a stroke of 3 feet. Both piston rods work on to one crank pin, thus the necessity of a cranked shaft is avoided. This arrangement makes a very compact engine—in fact, the space required is just as much as would be taken by an ordinary single cylinder engine. The crank shaft carries heavy fly wheel, and works a set of six ram pumps, three being driven from each side of the shaft. These pumps are capable of delivering 200,000 gallons of water per hour, at pressures varying from 10 to 100 lbs. to the square inch, and therefore no air vessel is provided in connection with them. No reservoir is needed, as the water flows from the fountains by large main to the pumps, and is forced back by another main, and as these two mains are of ample capacity, they always remain charged, and there is a sufficient supply to the pumps under all circumstances. The lights under the fountains are driven by two Siemens's dynamos, B, 13 size, equal to a current of 450 ampères, with an electro-motive force of 250 volts when running at 300 revolutions. These dynamos are driven by straps from two fly wheels, one on each side of the twin compound engine, with cylinders 15 and 26 inches diameter, by 2 feet 6 inch stroke. This engine is one of the three sent to South Kensington last year for providing the electric lighting to the grounds and fountains there, which installation was designated by the *Engineer* "as the most remarkable in the world." The lights were exceedingly steady; this was due to the extra high finish of the driving engines, which had every appliance for insuring freedom from stoppages, as well as giving the most perfect regularity, such as continuous lubrication whilst the engines were in motion, accurate balance and mathematical precision in fitting together the working parts. The fountains themselves are placed some 270 yards away, and consist of a large basin 120 feet diameter, with a raised rim about 3 feet above the ground floor and ornamented with 12 pilasters with vases. The floor of this fountain is made of timber covered with sheet lead, and puddled with clay so as to make all thoroughly tight. This basin always remains charged with water which flows away through a strainer into the return pipe and thence to the pump

house. Rectangular raised structures are built all over the centre of the basin in ornamental rockwork; each of these contains a glass skylight, as mentioned below, through which the light comes. The jets are about 100 in number and are placed over these skylights; they consist of one large jet in the centre, with its surrounding ring of small jets; an intermediate circle of large jets, each surrounded by its own ring of small jets, on an outer circle of jets with contiguous sprays. These sprays are a novel feature, and by them the water is broken up so as to give a much more effective and feathery display than could otherwise be obtained. All the jets can be lowered or raised at will by the operator, who is situated in the upper room of a manipulating tower some 30 yards away. He is provided with a complete system of levers connected with the valves under the fountains, and a full set of signals and telephones both to the slide operator under the fountains and to the engine house. He has thus control over every detail connected with the display, and can regulate either the water or lights at will. From this tower access is had to the room under the fountains from which the light is thrown. The coloured effects are obtained as follows:—an arc lamp is placed on the floor under each skylight, and coloured glass slides are arranged for slipping between the skylight and the lamp according as a change is required. At the London Exhibition, a man was stationed at each skylight, and made the changes as instructed, but, in the present instance, all is worked by one man who receives the signal from the tower, places in gear on a pulley the requisite stops, and moves all the slides simultaneously. By an ingenious arrangement, the same motion which places a set of slides on, takes off those previously in gear. The displays have so far proved a great attraction. On Saturdays, upwards of 20,000 witness the marvellous effects of the water and the brilliant colours, there being ample provision for the spectators. A patent has been taken out for this arrangement of fountains by Messrs. C. J. Galloway and J. H. Beckwith, the manager for the firm.

MESSRS. EDWARD GREEN AND SON, WAKEFIELD.

Between the boilers and the chimney, we observed that the committee had sanctioned the application of one of the well known economisers constructed by Edward Green and Son of Manchester and Wakefield. This apparatus, which supplies three of the working boilers, consists of 192 tubes; it is fitted with new patent access branch pipes and internal lids. We believe that by its agency a saving of many tons of coal a week is effected. At Stand 521, the same firm exhibit several of their fuel economisers, which can be either applied to the ordinary steam boiler or to gas-fired boilers, dye-pans, brewers' vats—in fact, wherever there is waste heat. In justice to the exhibitors, we feel in duty bound to say that it would be well-nigh impossible for anyone to produce more perfect examples of the ironfounders' handicraft. The tubes, important factors in economisers, are remarkably smooth, and are shown in their natural state; they are all cast vertically in dry sand, and are guaranteed to be absolutely free from blow-holes or unsoundness. The Green Economiser itself is too well known to need a lengthy description. It is, perhaps, sufficient to say that it consists of a set of cast iron tubes about 4 in. in diameter and 9 ft. long, made in sections of various widths, and connected together by "top" and "bottom" boxes, these again being connected by "top" and "bottom" branch pipes, running lengthwise, one at the top and the other at the bottom, on opposite sides, both outside the brick flue which encloses the economiser. Each tube is provided with a scraper, made to travel up and down the tube at a slow rate of speed, the object being to keep the external surface clean, soot being a non-conductor of heat. The motive power required is so small as to be immaterial. A space is provided at the bottom of the chamber for the collection of soot which is thrown off by the scrapers. All joints are "metal to metal," no red lead, hemp, etc., is used, and all working joints are outside the brickwork—an important consideration, as joints in the flue are not seen, and may leak for a considerable period without being discovered, thereby causing corrosion to set in. It is also very difficult to re-make a joint in a flue. The apparatus consists of 192 pipes, with the new patent access pipe. By this latter, each set may be flushed out separately, without breaking the joints of the whole range, as was formerly the case. This machine is fitted by the new dentated scraper, which is in every way a perfect soot remover. It has also patent knock-off lever, an improvement on the unsightly weight usually used, and improved valves, taps, etc. Another economiser has 96 heating pipes, and is fitted with the new internal lid, entirely doing away with the bolt and cross bar, and is very suitable where corrosive water is used. Provision has been made for excessively muddy water by a new patent bottom box. Edward Green and Son also show a small economiser for small steam users. It has 24 7-foot tubes, which can be easily



slipped into a small flue. Experience has taught the makers, after an endless variety of experiments with all sorts and sizes of metals, that a 4-inch cast iron tube cannot be excelled for effectiveness and simplicity. We noticed some nice specimen castings, as also a model of an inclined bottom box, used by the firm in 1842. Messrs. Edward Green and Son have made fuel economisers their sole business since 1849, during which time they have supplied the economiser to one hundred and fifty thousand boilers, representing some 5,000,000 h.p. We should recommend all those interested in the saving of fuel to pay a visit to Stand 521.

MESSRS. FRANK PEARN AND CO., MANCHESTER.

This firm's Stand, No. 519, is replete with high-class pumping machinery of varied types and capacities, ranging from 30 to 30,000 gallons per hour, made by Frank Pearn and Co., West Gorton, Manchester. As these are all shown in action, the exhibit is one of considerable interest to ordinary sight-seers, while to those on the outlook for this class of machinery, the display has peculiar attractions. The central figure in the group of exhibits is a well-proportioned, purpose-like, quadruple-acting pump, (Fig. 1.) having few complex parts, and built with a view to secure the maximum of duty, at the minimum of cost.

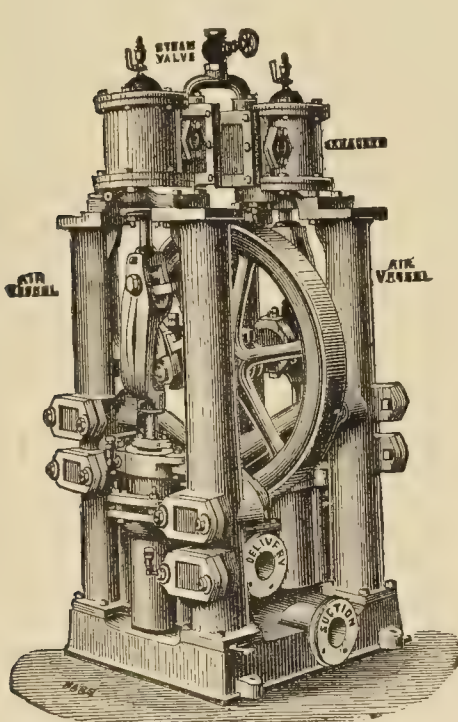


FIG. 1.

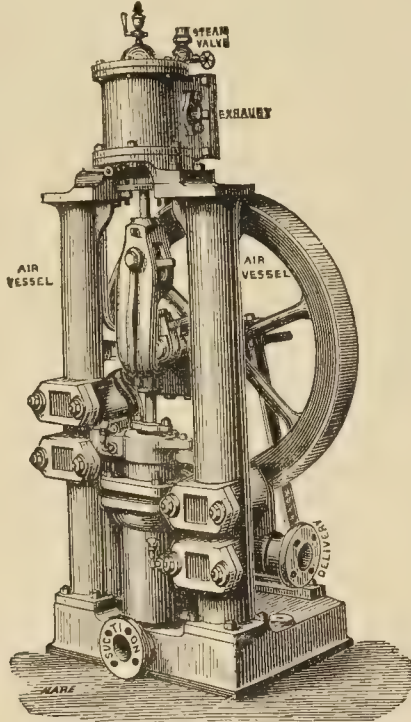


FIG. 2.

It is rigged up as a stationary fire engine, and shows an arrangement greatly growing in favour amongst mill owners. The rams are 10 inch diameter, the steam cylinders, 12 inch diameter, and the length of stroke, 9 inch. Its nominal capacity is 30,000 gallons per hour, but, when necessary, it can do effectively 50,000 gallons, as, for instance, when called into requisition for fire extinction. To illustrate its working in this

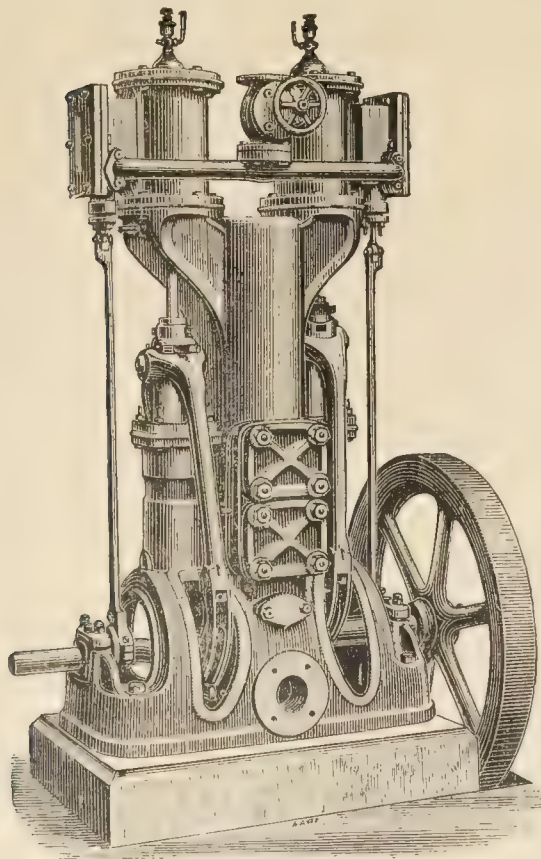


FIG. 3.

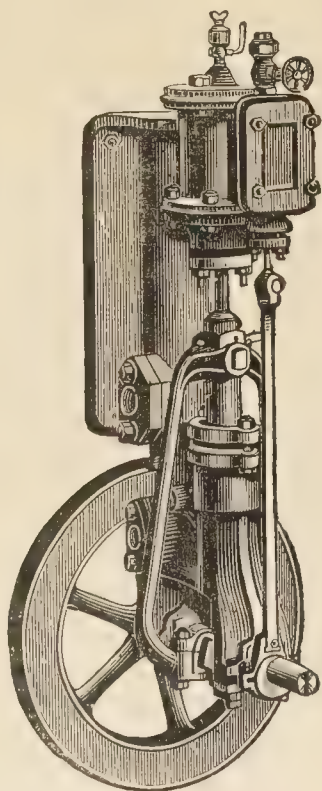


FIG. 5.

respect, six $1\frac{1}{2}$ inch nozzles are attached, the water pumped being taken from, and returned to, a tank in front of the stand. In addition to these, three pillars are fixed at the side of the tank, on which are arranged nine automatic sprinklers (the Grinnel, as made by Messrs. Mather and Platt, of Salford.) This latter installation is

made so as to give ocular demonstration of a salient feature of the pump, namely:—its absolute, instantaneous, automatic action. The design of this pump has been arranged with such mathematical precision, and the parts are so evenly balanced, that its action is sensitive in the highest degree. When at rest, if only one sprinkler is fused, thereby releasing the water, the pump will start of itself, and continue at any speed from minimum to maximum, according to the number of sprinklers fused. Within the limits of an exhibition stand, surrounded by valuable machinery, full, and exhaustive, trials with fire pumps are out of the question, but Messrs. Pearn can clearly show the principle of their pump, and this, by interesting, if somewhat curtailed, experiments; these, however, are of such a nature that it is not difficult for any intelligent observer to judge what the effect would be were the trials conducted under circumstances favourable for the full power of the pump to be utilized. In mills where sprinklers have been adopted, and reliance placed on a storage supply of water, the obvious drawback is that, when a fire breaks out and the conflagration spreads, the supply of water diminishes. But, when such a pump, as the one under notice, is brought into requisition, the volume of water increases, as the necessity for it arises, without the intervention of human aid. Where pumps of the ordinary type are used, often little can be done till the arrival of the engineer, or some one sufficiently acquainted with machinery. Here we have a pump starting instantaneously on its duty, with no possibility of delay, far less of failure, in the absence of any one to regulate its movements. As the tendency of the age is towards the adoption of automatic appliances in all branches of trade and industry, this self-starting pump cannot fail to attract the notice of high risk property owners or occupiers, who, we feel certain, will be favourably impressed by its performances. Messrs. Pearn's works at West Gorton are connected by telephone with

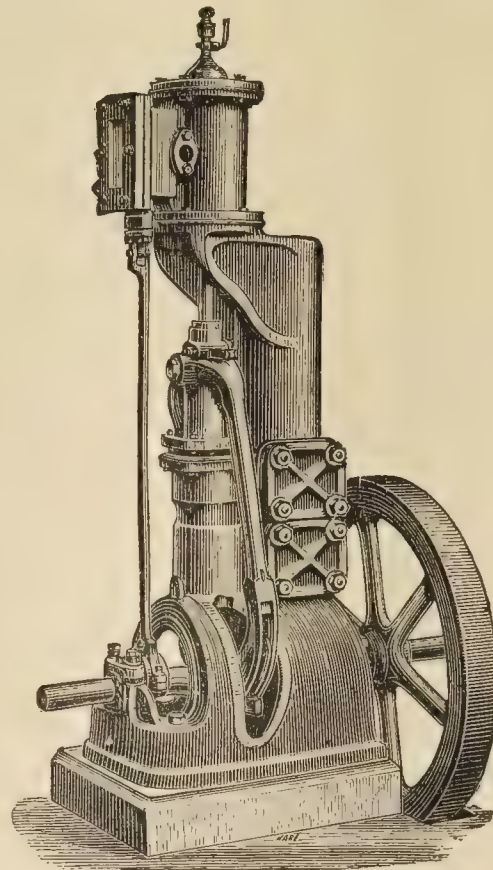


FIG. 4.

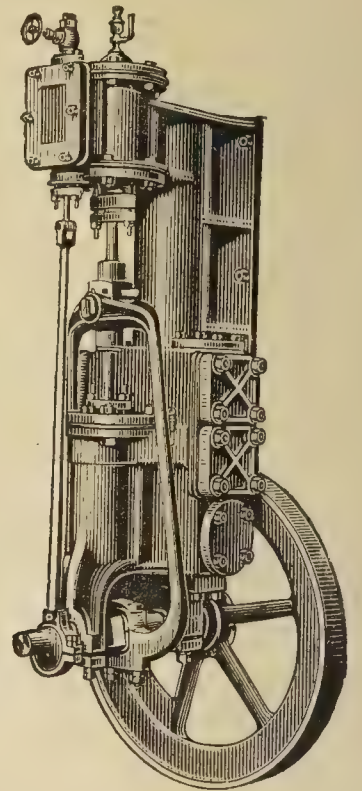


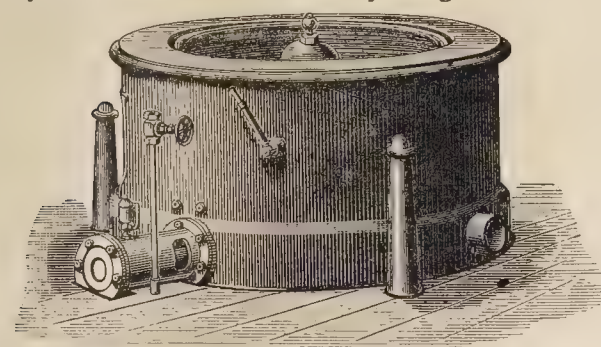
FIG. 6.

their Stand, so that visitors specially interested in any of their exhibits may ring up the principals, one or other of whom can keep an appointment in half-an-hour after receiving notice. Fig. 2 illustrates their patent double-acting pump, also arranged vertically, and as the class is made in over 100 sizes, the success of the design has been thoroughly established. Fig. 3—A long-stroke double ram "Manchester" pumping-engine is also shown, the details being 7 inch rams, 10 inch steam cylinders, 14 inch stroke, capacity 14,770 gallons per hour, being suitable for feeding a boiler of 945 h.p. Messrs. Pearn have gained a high reputation for this type of pump, both in single and double acting, and it is extensively used in collieries, iron-works, &c., where reliability is a matter of vital moment. As we have said, it is a long-stroke engine, the stroke being about one-third more than the average types of vertical ram pumps. There is also on the Stand a patent double-acting pump, 6 inch single ram, 10 inch steam cylinders, and 8 inch stroke, the content gallons being 5,920 per hour. Fig. 4 illustrates long-stroke single ram "Manchester" pump. Figs. 5 and 6—Pearn's "Manchester" donkey or wall pumps, single and double-acting, of world-wide fame, are shown in 18 sizes, ranging from $\frac{5}{8}$ inch single to 2 inch double-acting, with capacities of from 30 to 800 gallons per hour. These are shown on a uniquely constructed tower which revolves, whilst each pump is in action. To the uninitiated, this revolving tower is a source of astonishment, whilst those possessed of mechanical skill cannot but admire the ingenuity of the arrangement. Several photographs are fixed on the top of the tower, showing, in panoramic fashion, views of special contract pumps, which have been built for mining, colliery, oil-line pumping, and other similar purposes, where large volumes of water have to be dealt with. Amongst others,

we noticed illustrations of pumps doing 80,000 gallons per hour, 100 feet vertical lift; 28,800 gallons per hour, 200 feet vertical lift; 6,000 gallons per hour, 600 feet vertical lift. Altogether, the conception and working of this novel tower are a distinct success. Messrs. Pearn have been intrusted with the duty of feeding the splendid range of boilers supplied by Messrs. Galloway and Co. These are ten in number, and are fed by a quadruple-acting pump, same type as Fig. 1, having 7 inch rams, 12 inch steam cylinders, 9 inch stroke, the capacity being 16,500 gallons per hour. This pump is prominently placed in the boiler-house, where its working can easily be inspected. So far, we have been dealing with water, but Messrs. Frank Pearn and Co. come well to the front with air compressors. In this class of machinery, they show a newly-designed double air-compressor, having 8 inch air cylinders, 8 inch steam cylinders, and 12 inch stroke, the cubical capacity being 8,000 feet. The air cylinders are kept cool by a water jacket which surrounds them, and through which water circulates. When used as a vacuum pump, astonishingly favourable results are obtained, seeing that a column of mercury can be maintained to within one inch of the atmosphere; this means an almost perfect vacuum. Before concluding our notice, we may mention that Messrs. Pearn have issued a jubilee edition of their catalogue which, for convenience, has been made pocket size. It comprises some sixty pages, and deals almost exclusively with pumping machinery. Those of our readers who are interested in this class of machinery would do well to secure a copy (which can be had gratis), as we have no doubt they will find it a valuable *vade mecum*.

MESSRS. THOMAS BROADBENT AND SONS, HUDDERSFIELD.

This firm have, at Stand No. 401, an attractive display of their well known Patent Suspended Steam Driven Hydro-Extractors, one of which we illustrate. These machines are driven direct by a small steam engine, which, from its peculiar construction and accuracy of balance, can be run at a very high speed without any liability to get out of order. The reciprocating parts are made of carefully selected material, and as light as is consistent with perfect safety, in order to reduce vibration and unequal strain to a minimum; in addition to which, the centrifugal force of the connecting rod and crank, and eccentric and eccentric rod, is compensated with balance forged on the centre spindle, so that, even at the highest speed, the machine runs with perfect steadiness and absence of strain and vibration. The centre spindle is made of forged steel, and is provided with two long conical bearings, firmly fixed in the centre casting of the machine, the wear of which bearings can be easily and effectually taken up in a very simple and efficient manner. The lubrication of these machines is a special feature; it is all done from one or two places on the outside, and the oil, thus supplied, circulates over the whole of the wearing surface about them; by an ingenious contrivance, every time the machine is started, a few drops of oil are automatically forced through the crank pin and eccentric, and to this important feature, the makers claim that the durability of their machine is, in a great measure, due, as the necks are kept cool, and no oil is wasted. The machines, being suspended, require neither holding down bolts nor special foundations, but can be placed on an ordinary floor without fear of causing the slightest vibration; no power is wasted in shaking the ground, neither are the bearings heated and worn, nor the machine strained by the effort to vibrate when unevenly loaded and restrained by massive foundations. We stood by those at work in the Exhibition, and, even when on full speed, it would have been almost impossible to tell that they were running, except by the hum that is created by the great rate at which they revolve; in other



respects they were silent, and the absence of all vibration was remarkable, even when standing quite close. This method of direct steam driving, so far as regards hydro-extractors, has several important features which are strongly in its favour. By this mode, slipping and friction in starting are avoided, and as it is necessary for all

hydro-extractors to be stopped and started once for every load or operation, this assumes a very important aspect, especially when it is borne in mind that the weight of a large-sized basket, when fully loaded with damp material, approaches half a ton, and that this has to be rapidly raised from a state of rest to 900 or 1,000 revolutions per minute. The great difficulty hitherto, in regard to direct steam driven hydros, has been to construct an engine that should maintain the machine at a speed of something like 1,000 revolutions per minute, and yet be quite free from danger of breaking down or shaking loose; this difficulty appears to have been effectually overcome in the machine we have here under notice, and we learn that Messrs. Thomas Broadbent and Sons have now machines on their principle which have been in constant work for upwards of six years, and, with only ordinary attention, have cost nothing in repairs, and are still working as sweetly as ever. The machines exhibited by this firm reflect great credit upon them as regards workmanship and finish, and are in every respect calculated to strengthen their high reputation as makers of first-class hydro-extractors. They also show a small self-balancing hydro-extractor underdriven by belt; this machine is very substantial and compact, and has a 26-inch cage composed of strong tinned copper-plates. For laundries, or where a cheaper machine is required, this is everything that could be desired; there is no foundation required for it, and the method employed for driving avoids all cog-wheels or friction-arrangements with their accompanying noise and dirt.

MR. H. BURY, MANCHESTER.

The largest electric light installation yet attempted is that at the Manchester Jubilee Exhibition. The lighting is shown on two systems—the arc and the incandescent. The lighting on the arc system is supplied throughout the main building, machinery annexe, and the gardens, while the incandescent lighting, as stated in another notice, is fitted in the Fine Art Galleries, in the various shops, etc., in the buildings, in the quaint streets and shops of “Old Manchester and Salford,” and in other portions. The whole of this lighting has been intrusted to three firms, and there is, consequently, not the same variety in the installations as in those at some of the late International Exhibitions. There are several very interesting exhibits by private firms. Perhaps one of the prettiest shows is that by Mr. H. Bury, electric light contractor, 27, Arcade Chambers, St. Mary's Gate, Manchester (Stand No. 364, in the machinery annexe). This firm shows various ideas of lighting private houses, mills, &c., on the incandescent system. The lights are supplied from an improved type gramme dynamo machine, having an output of 80 lights, driven off a counter shaft by a Walton link belt. The Stand is arranged in the form of a dome, the lights being suspended from the top on silk flexible pendants, while, on one side, a neatly mounted table with top piece is fixed, upon which are some very handsome brass brackets, with lamps attached to each, and, in the centre, a polished mahogany switch board on which is fixed a variety of switches, fusible cut-outs, &c., for controlling the lights. The lamps used are those known as the “Victoria” type, and each is fitted with improved bayonet joint holders of the Vitrite pattern. Fusible cut-outs, on non-combustible bases, are provided to each lamp in order to prevent any excess of current damaging the same. The exhibit is very tastefully arranged, and anyone interested, or intending to adopt the electric light for their mills, would do well to pay a visit and to see for themselves the way in which this enterprising firm erect their installations. Mr. Bury (who is agent for Davey-Paxman and Co., engineers, Colchester), also exhibits a 75 indicated horse power improved compound vertical steam engine of their new “Windsor” high speed type. The cylinders are mounted on massive cast iron back standard, with steel columns in front, and are lagged with felt and polished mahogany, and bored out to—High pressure cylinder, 9½ inches diameter; low pressure cylinder, 16 inches diameter; stroke, 12 inches. The engine is fitted with Paxman's patent automatic expansion gear and quick speed governors, and is capable of working at a steam pressure of 120 lbs. All the wearing parts have been made with extra large surfaces to allow for long running. The engine is very compact and neatly constructed, and is worthy of inspection. It is at present used for driving two arc light dynamos, having an output of 40 lamps. In addition to electric lighting, Mr. Bury is a contractor for every kind of electrical work, and also for the fitting up of factories with automatic sprinklers and general fire apparatus. He is also agent for the universal wrought iron split pulley.

CHATWOOD'S PATENT SAFE AND LOCK COMPANY, LIMITED, LONDON, MANCHESTER AND BOLTON.

As the original inventor of self-contained steel strong-rooms for banks, Mr. Chatwood has taken advantage of the opportunity afforded by this Exhibition to offer practical illustrations of his system. The most massive example exhibited by this firm is on the Stand devoted to safes and locks (No. 592, in the silent machinery section), and is one of their patent self-contained steel strong-rooms, 8 feet 6 inches high, 7 feet wide, and 5 feet 6 inches deep, fitted with patent ventilation lamp and folding gates, with self-fastening arrangement to avoid the use of bolts on the left-hand gate. This strong-room, which weighs about 10 tons, is as large as the space at their disposal would permit, and is really two steel strong-rooms, one within the other, with five inches space between the two; the two rooms are made structurally one by rolled girders, planed on their tables so as to bed truly on the inside of the outer, and the outside of the inner room; the rivets and screws fit into conical holes in the plates, so that the heads are flush with the surface of the plates. The chambers between the two rooms are filled with steam generating fire resisting composition, which, in the event of fire, will keep the plates cool, and so prevent injury to the contents of the strong-room. This system of construction affords the greatest amount of protection against injury by the falling of heavy debris in destructive fires, and economises the space usually taken up by thick masonry walls. The door of this room presents several novel features well worthy of minute inspection, particularly his patent safety door, carried by the main door, for use in cases of emergency, forming, as it does, a second means of access, without taking up any of the wall space of the room. Although not so massive as the room above referred to, yet by far the most interesting is a working model, about 5 feet square, of one of their self-contained rooms, with patent hydraulic balance elevator in the centre of the room. This is partly a model of the first steel strong-room ever built, designed by Mr. Chatwood for Messrs. Hardcastle, Cross and Co., now Bolton branch of Manchester and Salford Bank, and partly of self-contained steel room, designed for the Union Bank of Scotland, London, and perfectly illustrates his improvements for the protection of valuable securities in large depositaries for bank protection. On the top of the strong-room are placed the boards forming part of the floor of telling-room of the bank, the strong-room being in the basement. The elevator standing in the bank during the day descends on its hydraulic ram into the strong-room at night, and, indeed, as often as the exigencies of the business require that bullion, &c., should be brought up; this permits the whole of the strong-room and contents being under the control of the manager and higher officials. The strong-room is provided also with a check safe, for controlling the valve and night bolt of the strong room. The lighting and ventilating arrangements are most perfect. The door of this room, having its lock case covered only by plate glass, for the purpose of shewing the various patented principles of construction, which have made Chatwood's “Invincible” safes so famous, discloses the secret of their success. The

arrangement of "patent dovetail sliding claw bolts is a marvel of ingenuity and simplicity, being secured in position by 'blocking bars' and these, in turn, by Chatwood's patent composite lock," while the key of this main lock is rendered useless, for burglarious purposes, by the steel shield which is thrown over the keyhole by a smaller lock, which is also described as "Invincible," unpickable, and gunpowder proof. One is also much struck with the entire absence, in the construction of this door, of the great array of bolt heads, which are seen surrounding the inside face of the doors of safes by other makers, and, on asking an explanation, we are informed that "Chatwood's" patent solid flange lock case "being a very strong steel angle, made practically solid with the door, renders the use of these bolts unnecessary," indeed, this firm refuses to make, under any circumstances, a safe relying for its security upon what they term "screwed lock cases," and considering that their own workmen, in the Great Safes' Challenge Contest at the Paris Exhibition of 1867, "stripped" the screwed lock-case entirely off the door of the "Yankee" safe in 29 minutes, and that with only 12 pounds weight of burglars' tools, they are probably justified in refusing to believe safes, having screwed lock-cases, to be burglar-proof. After an inspection of the door and boltwork of this model strong-room, which is a facsimile of the doors and boltwork applied to all Chatwood's "Invincible" safes, one is not surprised to hear of the success this firm have achieved in all parts of the world, as is indicated by the array of medals and diplomas at their safe stand, every one of which, we are informed, represents the highest award of the exhibition at which it was obtained, they, in no single instance, having been awarded a second position. For the present, we leave Mr. Chatwood, feeling that we have been in the company of a man who is thoroughly devoted to the work he undertakes, and who runs no great risk in stating, in his price list, that purchasers of these safes (the "Invincible") are allowed thirty-six hours test with any kind of burglars' appliances before delivery.

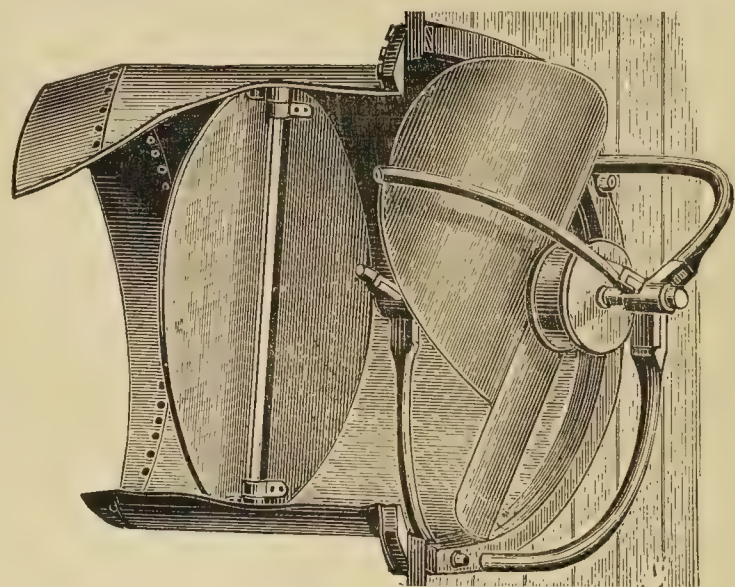
MESSRS. CRIGHTON AND SONS, MANCHESTER.

This firm exhibit Higgins' Patent Express Roving Frame, 7 inch lift, 60 spindles, with patent fixed long collars and swivel attachments to rails, making a 7 hank roving, with spindles running nearly 1,400 revolutions per minute. We are informed that as far back as the year 1862, a machine on this principle was making a 50 hank roving, with 2,000 revolutions of spindle per minute, and these spindles are still running in excellent condition, testifying to the extraordinary durability of these frames at high speed, of which there are upwards of 600,000 spindles running on this patent, supplying 5,000,000 spinning spindles. This great speed is obtained by the introduction of several novelties, the chief being for supporting and driving the spindles. The spindle is effectually supported by a stationary tubular bolster, extending from the lower spindle rail to the bottom of the flyer. This long bolster is suspended on two joints at right angles with each other, attached to the spindle rail, on which it oscillates, and is supported at its upper extremity by a sliding bush or bolster attached by two similar joints to the coping rail, so that, owing to the compensation afforded by those joints, the bolster slides freely on the tubular bearing; as a further consequence of this arrangement, the spindle revolving inside the bolster is entirely unaffected by the traverse of the coping rail, so that it is impossible to bind the spindle in any position of the rail, an evil very prevalent with frames having long bolsters and working on weak floors. The pinion is attached to the spindle without set-screw. This is accomplished by squaring the lower end of the spindle, which thus fits easily into a square hole in the pinion. The pinion is supported by an independent bearing, so that the spindles can be withdrawn from the frame and replaced without affecting the position of the pinion or the use of the screw-key, thus making it easy to clean and oil the frame very quickly. Another novelty is an improved cone frame, by means of which they are enabled to regulate the tension of the cone strap, and to secure increased facilities for doffing and starting a fresh set of bobbins. By means of these, and other improvements in this frame, it is stated that much greater velocities can be obtained for the spindles than hitherto have been gained in the ordinary frame. The frame is lower than those of the usual construction, which makes it much easier for the attendant when creeling, etc.; in fact, the makers appear to have used every effort to render the working of the machine as easy as possible. A valuable improvement, of recent date, is the "New Patent Diagonal Shaft Driving Arrangement," which dispenses with the swing wheels, and gives much more regular winding than usual, with fewer thin places in the sliver, and prevents irregular tension between the front roller and top of flyer. This arrangement, however, is not applied to the exhibit, but may be seen at the works of Messrs. Crighton and Sons, Castlefield Ironworks, Knott Mill, who are the sole makers and proprietors, (by assignment from the late firm of W. Higgins and Sons), of all patents on these frames for England and the continent.

MESSRS. MATTHEWS AND YATES, MANCHESTER.

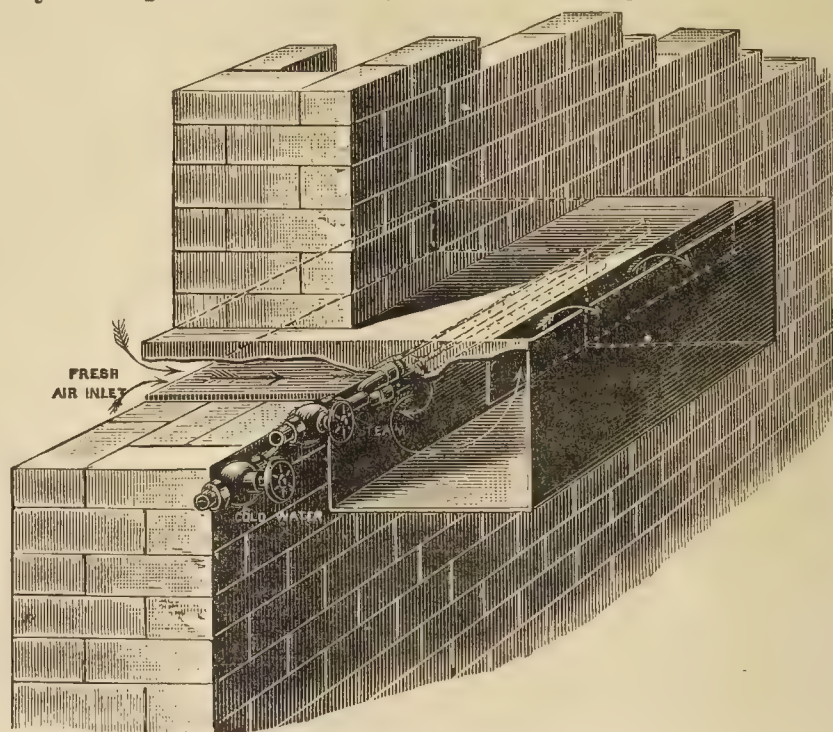
The "Air Propeller" which this firm exhibit is now so well known by those who are interested in this kind of mechanism that it requires but little description. It is specially adapted for moving large volumes of air, with a slight expenditure of power; for ventilating textile and other works, in all their varied departments; for removing dust, the accumulation of which is often prejudicial to health, from wool sorting rooms, carding rooms, scutching mills, &c.; for drying yarns, wools, linen and other textile fibres; and for clearing steam from dye and bleach works, and similar establishments, it acts most efficiently. In drying wools, yarns, and fabrics, by these propellers, especially those that

have been in any sizing process, the colour and finish are not at all injured, as is the case in many processes of hot drying, but the nature is all retained in the goods after the drying operation. In fact, it is now acknowledged by spinners, manufacturers and others, in the textile trades, that "air propellers" are an absolute necessity. The process of drying by this mechanism is as quickly performed as by any known method, with the great advantage that it is carried out at a low temperature. For ventilating buildings in which great numbers of people are congregated, it is unique. This firm have a number of the propellers in operation, both at the Manchester and Saltaire Exhibitions, and, in addition, they show their



"automatic closing doors" which they have recently patented. From the annexed illustration, an idea of the working of these doors may be had, the object of which is to prevent cold air blowing into the rooms when the propeller is not working, as, immediately the propeller is set at work, the doors open, so when it

is stopped, they close again, without requiring any attention whatever from the workmen. This invention will be welcomed by users of propellers, as the constant draught of air passing through the opening between the fans was a source of annoyance and discomfort when the propellers were not at work. Messrs. Matthews and Yates also show the Humidifier; this is intended to supply a want very much felt in textile factories for a suitable means of moistening the air in rooms, especially during frosty weather, and when easterly and hot dry winds prevail. The apparatus is a rectangular chest, with an



opening on one side communicating with the outside atmosphere, through which fresh air is admitted into the humidifier, where, in cool weather, it comes in contact with jets of steam, and, if required, in hot weather, sprays of water are introduced, and, becoming thoroughly penetrated with moisture, it passes through another opening into the room. The method of using these is to fix humidifiers on one side of a room, and propellers on the other, then a constant flow of fresh humid air is kept up through the rooms, and, in places where they are in use, a great amount of work can be got out, and the rooms are kept much more pleasant and healthy.

(Continued on page 68.)

ORIGINAL DESIGNS.

On our first plate is a portrait of Lemuel Clayton, Esquire, silk spinner, of Halifax, Yorkshire, the story of whose life will be found on page 61.

* * * *

Our second plate contains a very effective Design for Printed Muslin Curtains, which we publish by the kind permission of the designer, Mr. Leon Lang, 16, Peel Terrace, Old Trafford, Manchester.

* * * *

Our third plate contains a Design for a Tapestry Fabric. It has been designed by Mr. R. T. Lord, 97, Park Road, Bradford.

June 12th, 1887.

THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.



EMINENT TEXTILE MEN.

No. 8.—LEMUEL CLAYTON, Esq.





TAPESTRY FABRIC



Fancy Suitings.

No. 458. 1,408 ends.
 22 „ per inch. Straight draft.
 22 picks „
 11's slay. Weight 20 ozs.
 2 ends in a reed.
 64 inches wide in the loom.
 56 „ when finished.

* Design.

Warp:—

2 Black 12 skeins.		1 Black 12 skeins.
1 Black 30 skeins	} knob twist.	1 Brown and White, knob twist.
Blue 30 „		1 Black 12 skeins.
White 30 „		1 Brown and White „
1 Brown 12 skeins	} „	2 Black 12 skeins.
White 30 „		1 Crimson, Green and Orange „
2 Black 12 skeins.		1 Brown and White „
2 Brown and White „		1 Black 12 skeins.
2 Black 12 skeins.		1 Brown and White „
1 Black, Blue and White „		1 Black 12 skeins.
1 Brown and White „		1 Brown and White „
2 Black 12 skeins.		2 Black 12 skeins.
2 Brown and White „		1 Crimson, Green and Orange „
2 Black 12 skeins.		1 Brown and White „
1 Crimson 30 skeins	} „	2 Black.
Green 30 „		2 Brown and White „
Orange 30 „		
1 Brown and White „		44
2 Black 12 skeins.		
2 Brown and White „		

Weft:—

	2 picks Black 12 skeins.	
	1 pick Crimson, Green and Orange, knob twist.	
	1 „ Black 20 skeins	} „
	White 20 „	
	2 picks Black 12 skeins.	
	2 „ Black and White	„
	2 „ Black 12 skeins.	„
	1 pick Crimson, Green and Orange	„
	1 „ Black and White	„
Three times {	2 picks Black 12 skeins.	
	2 „ Black and White	„
Twice {	1 „ Black 12 skeins.	
	1 „ Black and White	„
	2 picks Black 12 skeins.	
	2 „ Black and White	„
Twice {	1 pick Black 12 skeins.	
	1 „ Black and White	„
Three times {	2 picks Black 12 skeins.	
	2 „ Black and White	„

48

No. 459.

Warp:—

4 ends Pea Green Mixture 12 skeins.
 1 end Claret 20 skeins, twisted to Olive 12 skeins, 4 runs per inch.
 2 ends Olive 12 skeins.
 1 end Claret and Olive twist.
 4 ends Pea Green Mixture 12 skeins.
 1 end Claret and Olive twist.
 2 ends Olive 12 skeins.
 1 end Black 20 skeins, twisted to Crimson 20 skeins, and over-twisted with 40 skeins Black, 3 runs per inch.

* Pegging Plan.

Pegged to fall.

Woven:—

19 picks Black 12 skeins.

1 pick Black 40 skeins, twisted to Tan 12 skeins, at 3 runs, and over-twisted with Black 40 skeins, at 3 runs per inch.

1,792 ends ; 28 ends per inch ; 28 picks per inch ; 9 healds ; 7's slay ; 4 ends in a reed ; 64 inches wide in the loom ; 56 inches wide when finished. Finish clear. Weight 22 ozs.

No. 460.

Warped:—

12 ends Stained White 22 skeins, twisted to Canary 22 skeins, 8 runs per inch.
 1 end Green 22 skeins, twisted to Crimson, 22 skeins, 12 runs per inch.
 16 ends Stained and Canary twist.
 1 end Green and Crimson „
 18 ends Stained and Canary „
 1 end Green and Crimson „
 All Cheviot.

Woven:—

14 picks Drab Grey Mixture, 2/22 skeins woollen.
 1 pick Green and Crimson twist.
 18 picks Drab Grey Mixture „
 1 pick Green and Crimson „

* Pegging Plan.

1,536 ends ; 24 ends per inch ; 24 picks per inch ; 12 slay ; 2 ends in a reed ; 12 healds ; 64 inches wide in the loom ; 56 inches wide when finished. Pegged to fall. Cheviot finish. Weight 20 ozs.

No. 461.

Warp:—

3 ends Black cheviot, 16 skeins.
 2 „ Black 40 skeins, twisted to White 40 skeins, 20 runs per inch.
 2 „ Black cheviot 16 skeins.
 1 end Black cheviot 2/16 skeins, twisted to White 40 skeins, slack knob twist.
 2 ends Black cheviot 16 skeins.
 1 end Black 40 skeins twisted to White 40 skeins, 20 runs per inch.
 1 „ Black cheviot 16 skeins.
 1 „ Slack knob twist as before described.
 3 ends Black cheviot 16 skeins.
 2 „ Black and White twist 40 skeins as before described.
 2 „ Black cheviot 16 skeins.
 1 end Slack knob twist.
 2 ends Black cheviot 16 skeins.
 1 end Black and White 40 skeins twist.
 1 „ Black cheviot, 16 skeins.
 1 „ Slack knob twist.

Woven:—3 picks Light Grey 16 skeins cheviot.
 1 pick Black 16 skeins twisted to White 16 skeins, 6 runs per inch.

1,980 ends in warp ; 30 ends per inch ; 29 picks per inch ; 6 healds ; 10's reed ; 3 ends in a reed ; 66 inches wide in loom ; 56 inches wide when finished. Straight draft. Cheviot finish. Weight 22 ozs.

No. 462.

Warp:—8 ends Blue worsted 2/28's.
 8 „ Tan „ „

Weft:—4 picks Black worsted 2/28's.
 4 „ White „ „

* Design.

6,240 ends in warp ; 96 ends per inch ; 46 picks per inch ; 8 healds ; 12's slay ; 8 ends in a reed ; 65 inches wide in the loom ; 56 inches wide when finished. Straight draft. Finish clear, smart and soft. Weight 21/22 ozs.

Manchester Jubilee Exhibition.

(Continued from page 66).

MESSRS. GEORGE THOMAS AND CO., MANCHESTER.

This firm, whose office is at 28, Deansgate, Manchester, show Staub's universal yarn-assorting balance, in Section I, Stand 11. This is a recent invention, and has been constructed for the purpose of indicating the counts of cotton, worsted, woollen, linen, silk and other yarns, and also for the warps and wefts of union fabrics made of different fibres. In spinning and other mills, this mechanism will prove of immense advantage. The yarns are made to be their own weights, and to indicate their own counts with great accuracy, by cutting the patterns to the size of carefully prepared templets, one of which is supplied for cotton, worsted and woollen, and one for linen, whilst others can be supplied at small cost for other fibres if required. At Stand 580, Section II, they show their universal milling machine, with 3 speed cone, making 6 changes of speed, spindle with arbor projecting 20 inches, the spiral bed can be set at angles of 35° each way from centre line of spindle, and fed automatically, 16 inches, taking also 16 inches between centres, and will swing 11 inches horizontal movement of spiral clamp bed $6\frac{3}{8}$ inches, and the vertical movement below spindle centre is 10 inches. It is fitted up complete. It is claimed, especially for this machine, that it is well and carefully constructed in every detail, and at a reasonable price. A really good milling machine is most indispensable in every tool shop and engineering establishment, it is the tool of the future and only requires to be better known in order to be universally adopted. Messrs. Thomas and Co. show, in the chemical department, cotton yarns, slubbings, rovings, &c., dyed and bleached in the cop, and on spools and bobbins, by Messrs. Ch. Weber et Cie., of Thann (Alsace), for whom they act as agents. The special interest in this exhibit is that, hitherto, no one has ever been able to dye or bleach cotton in the cop, roving, etc., in a practical and successful manner. We are informed that this process of dyeing and bleaching cotton yarn, (in the cop) patented in the United Kingdom, etc., is the result of fully eight years practical experience and continued experimenting, so that now it may be asserted with satisfaction that it is "*un fait accompli*." The patent rights being for sale, nothing has yet been dyed or bleached, here, on this process. The samples exhibited have all been dyed at the works at Thann. As regards the annual production attainable in England, we may say there is hardly a limit; it is only necessary to consult the quantity of yarn dyed yearly, in the hank, to form an idea of what the production on this patented process could be. The process dispenses with reeling, pirn winding, etc., operations which demand, not only space, machines and motive power but, a staff of workpeople proportionately large; further, there is a great economy as regards waste; economy in cost of dyeing plant; and economy in cost of drugs and saving of labour, which is of paramount importance. By this process experienced hands are dispensed with, children being equal to the labour required. All the rest is merely a mechanical operation, requiring simply supervision and exactness. In England, where labour is dearer, the economy per lb. of yarn dyed will be greater. There is also economy in steam required. There is neither shrinkage nor loss in length. Dyeing yarns on this new process in cop, slubbing, and roving bobbins, ring frame bobbins, etc., opens out an entirely new industry.

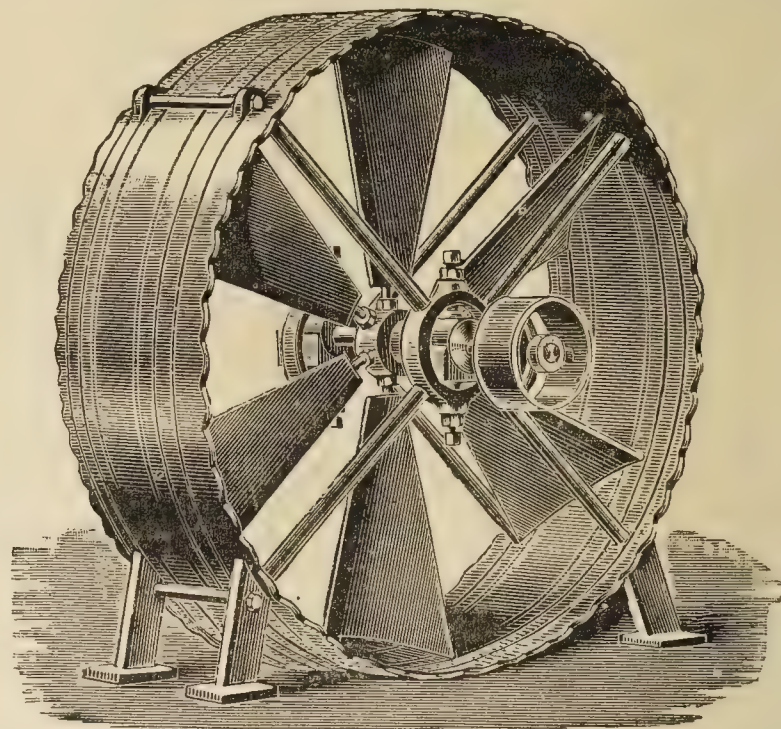
THE MANCHESTER AND DISTRICT EDISON ELECTRIC LIGHT COMPANY, LIMITED.

The electric lighting at the Manchester Exhibition by arc and incandescent lamps far exceeds anything of the kind which has hitherto been attempted. When the Exhibition was first decided upon, the Manchester and District Edison Electric Light Company, 12, Victoria Buildings, Manchester, were entrusted with a commission to light certain portions of the building with about 3,000 glow-lamps; this work has been executed in such a manner as to give entire satisfaction to all concerned. The lighting by incandescent lamps is divided into three sections, the Fine Art Galleries, with 1,620 lamps, the Palm House, now used as dining-rooms, with 750 lamps, and the ancient houses, shops and other buildings, known as "Old Manchester and Salford," with about 600 lamps. The lighting of the Fine Art Galleries had to be effected with the greatest possible care, as pictures estimated at a value at £2,000,000 are on view, which had, of course, to be covered by insurance. Mr. Musgrave Heaphy, C.E., of the Phoenix Office, was deputed by the various Insurance Offices to examine the arrangements made, and his reports have been favourably received and insurances effected. The lamps used are those known as the Edison-Swan, they are of 16 candle power, and are fitted with 5 inch opal shades, which reflect the full force of the light upon the pictures. Each lamp is attached, in the ordinary way, to branch wires connected with the subsidiary mains, which pass through the walls of the galleries, where they join the heavy main cables—of which there are four pairs—attached to the dynamos. Each room in the galleries is connected with two different circuits, so that, in case any dynamos break down, only half the lights in each room will be extinguished. These circuits have been so carefully arranged that the illuminating power will be easily maintained at full, and without variation throughout the great area covered by this section. The illuminating of the Palm House is brilliant and effective. From the roof, and also amongst the foliage and ferns, are suspended numerous lamps, throwing a soft light upon the dining-tables, whilst others are placed at the ends of the building. Ruby glass shades cover

each cluster of three lamps. The result is very charming and pleasant. There are three pairs of main cables for supplying these lights, running for a distance of over 400 yards from the dynamos. Three pairs of main cables light that portion of the Exhibition known as "Old Manchester and Salford," which is situated at a distance of about a quarter of a mile from the dynamos. From a mast, 100 feet high, two arc lamps, 6,000 candle power each, are fixed, working on the incandescent circuit. These light up the streets of this ancient quarter. As will be seen from this brief notice, the installation is most extensive, and, having been conducted in the most satisfactory manner, reflects credit upon the Manchester and District Edison Electric Light Company, who have been represented in the matter by their manager, Mr. J. R. Williamson, M.S.T.E. This company are sole owners, within certain districts, of the Edison and Swan Patents, including Dynamos and Lamps, and are also sole agents for the North of England and Scotland for the Elwell-Parker Dynamos and Accumulators.

MESSRS. EDWARD RENSHAW AND CO., MANCHESTER.

This firm, whose office is at 19, Corporation Street, have on view, at Stand No. 501, machinery section, their Wing Disc Fan for removing dust, and for generally ventilating factories, sheds, or other places of business, and also for drying wool, cotton or other fibres. This fan is simple in construction, and requires but a small amount of power to run it, and, being enclosed in a frame-work, there is no danger of accidents. The blades are curved and have an expanding pitch, thereby increasing the amount of air moved and reducing the slippage; they are also adjustable, and can be set to suit requirements, and are, therefore, available for use under widely varying conditions. Being convenient in form, and very light in weight, the fan can be set in any required position with the greatest ease, and is quite noiseless in its action. Messrs. Renshaw and Co. have compiled a book which sets forth the various purposes for which their fan may be used, and, as it contains numerous illustrations,



it will prove interesting to those who contemplate the application of fans to their factories. We may here particularly refer to one of these illustrations, which shows the application of the fan to the drying of wool, cotton, or other fibrous substances, by which arrangement very large rooms can be used to advantage with one fan and one coil, and great quantities of material can be dried quickly at a low temperature, whilst fire from friction is impossible. Messrs. Renshaw and Co., have perfected a capital combination of a fan and double engine for use in those places where there is steam but no engine. This double engine is placed upon the fan frame and shaft, and is practically a part of the fan, and being neat, compact and light, will run with very little care. They are useful for running at night, when a large engine will, of course, be standing, whilst their cost is not a serious item; a 24 inch fan and engine being £25. In the book we have mentioned above are testimonials from textile firms speaking highly of the fans supplied by Messrs. Renshaw and Co.

THE MODEL PRINTING PRESS COMPANY.

Prominent among London exhibits, at the Manchester Jubilee Exhibition, is the display by the Model Printing Press Company, 3, Ludgate Circus Buildings, London, of their many specialities. We venture to think that many of our manufacturers will find a visit to the stand of this enterprising Company, No. 455, Machinery Section, of interest, and, we doubt not, of profit too, if purchases be made. In our last November issue, we called the attention of our readers to the Pattern Cutting Machines, supplied by this firm, and may once more briefly recapitulate their advantages. The two smaller sizes, which are worked by a hand lever, are of the simplest construction, are perfectly reliable, have a guillotine action, and cut, respectively, 12 and 20 inches in length. The prices are £7 18s., and £15 16s. A heavier, and much more power-

ful, and, consequently, more expensive, cutting machine is also made by the Company, with vertical and diagonal action and continuous motion, giving a quick return of knife: to cut from 20 inches, £38, to 40 inches, £130. Steam fittings—£5 extra. The Small Job Printing Presses, of which the Model Printing Press Company are the manufacturers and patentees, struck us as being eminently serviceable in factories and warehouses, and it did not surprise us to learn that well known firms in cotton, corset, hosiery, and other industries, have long availed themselves of these appliances. It is scarcely possible for a manufacturer to procure a printing machine better suited to his requirements, a special feature being that any length of wrapper may be operated upon without folding. Suitable outfits complete, with types for any particular work, may be readily obtained from the Company. The use of these machines presents no difficulty, and a sharp boy will, with little practice, be able to do all that is required in the way of setting up type, nor is the expense attending the use of the presses more than trifling, whilst the first cost of outfit is £4 10s. to £50, according to size of press required; firms may thus ensure considerable economy. Useful wire binding or stitching machines are catalogued by the Company to work by hand or by treadle, and to stitch up to three-quarters of an inch, and these are invaluable in sampling goods. Full particulars, with prices, may be had on application to the Model Printing Press Company, 3, Ludgate Circus Buildings, London, E.C.

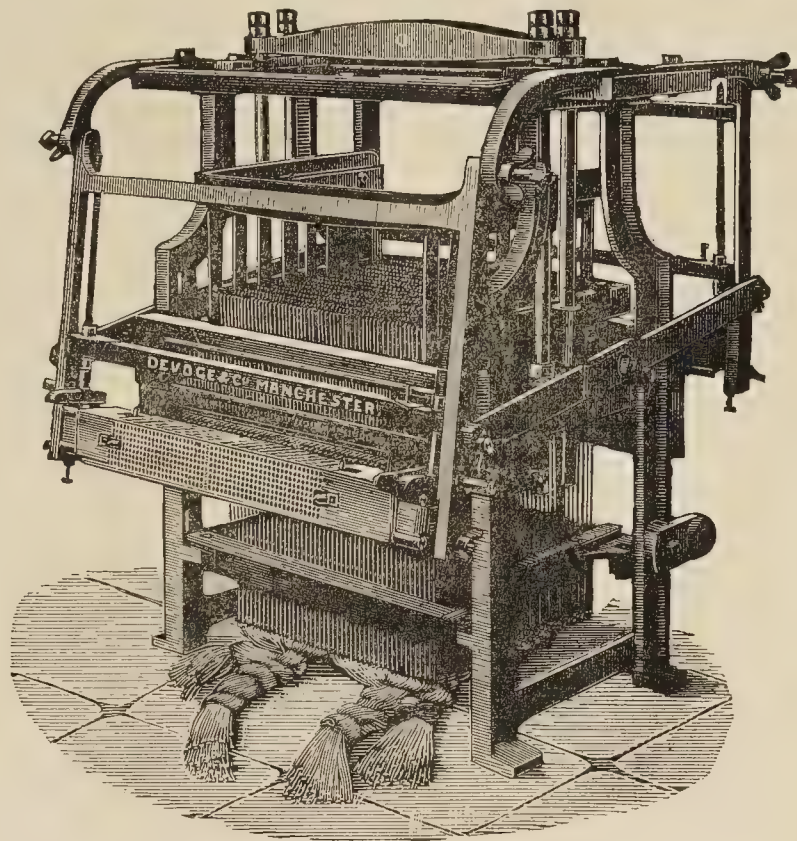
MESSRS. LEE AND HODGSON, MANCHESTER.

TITANCRETE.

It has long being recognised that in fire-proof buildings, as at present erected, the iron columns and girders under great heat expand and contract, thus, when a fire occurs, they assist, rather than prevent, the destruction of a burning building, and after a fire are quite useless for reconstructing purposes. Hence, a want has been felt for some material capable of resisting the greatest heat. Messrs. Lee and Hodgson, of Deansgate, Manchester, have supplied this deficiency. By the combination of two of the strongest materials now used in building, and for which they have been granted a patent, they produce a perfectly fire-proof substance which they have named "Titancrete." The principle, in its comprehensive form, consists in completely bedding and covering a strong steel framework with concrete, and flushing it with cement. The steel framework acts as a skeleton for the purpose of giving form and cohesion to the concrete, and for distributing the strain. The inventors claim that, being perfectly fire-proof, it is particularly adapted for the construction of columns, floors, girders, partitions, doors, shutters, slabs, water-tanks, and that, by its use, a thoroughly fire-proof building may be erected. Titancrete has been subjected to severe tests in order to prove its fire-resisting capabilities. On one of these occasions, Superintendent Tozer, of the Manchester fire brigade, being present, he gives the following testimony to its adaptability to the purpose for which it has been invented. "On the 31st August, I attended the second test, a building one floor high had been erected, the walls were of brick, the roof consisted of slabs of concrete three inches thick, having steel bars running diagonally through them; inside the brick compartment were slabs and pillars of concrete, and the door was of the same material, 1½ inch thick. A large fire consisting of coals, timber, shavings, and petroleum oil was lighted and kept burning for three hours, the fire was then rapidly extinguished, and water was projected upon the slabs and pillars from the pressure of the water-mains through a 6-8 jet. It was then found that the concrete slabs and door were uninjured, and that the pillars were slightly flaked upon the surface." On another occasion, having witnessed an experiment, Superintendent Tozer says:—"On the 25th January, I was present at another trial of the concrete. A two storey building had been erected in the Police Yard, Albert Street, the walls were of brick, the floor of the second storey was composed of Titancrete slabs, resting on girders supported by pillars. On the ground floor there were a flight of steps and a door. In the room over, there were two window shutters and a door. The doors, shutters, flooring, pillars and girders were all of Titancrete. In the second floor was placed a quantity of raw cotton, waste and straw, both upon the floor and upon racks. In the ground floor was placed a large quantity of shavings, wood and coals, the whole being thoroughly saturated with mineral oil. The fire was lighted and kept burning for three hours, when it was extinguished as rapidly as possible by a jet from the street mains. I immediately entered the room over the fire, a thermometer, which had been placed therein, registered then only 110 degrees. The cotton was sensibly warm, but quite uninjured in any way. On the ground floor, the Titancrete slabs, pillars, girders and door, were perfectly sound; there was a piece of plaster flaked off the flight of steps, but their strength was not in the least impaired. By way of comparison, I suggested that some 3 inch stone flags should be placed during the trial along-side the flight of steps, this was done, and in less than 30 minutes after the fire was lighted the slabs were in pieces. The Titancrete door upon the ground floor was used for three tests, and most successfully withstood them. I consider the results of these trials has been very satisfactory, indeed the fire-resisting qualities of Titancrete have been fairly demonstrated, and the material will be found suitable for doors, shutters, props, girders, stairs, floors and partitions; the interlacing with steel bars imbedded with the concrete will render the mass capable of withstanding great weights, without either the risk of expansion or contraction when subjected to fire and water."

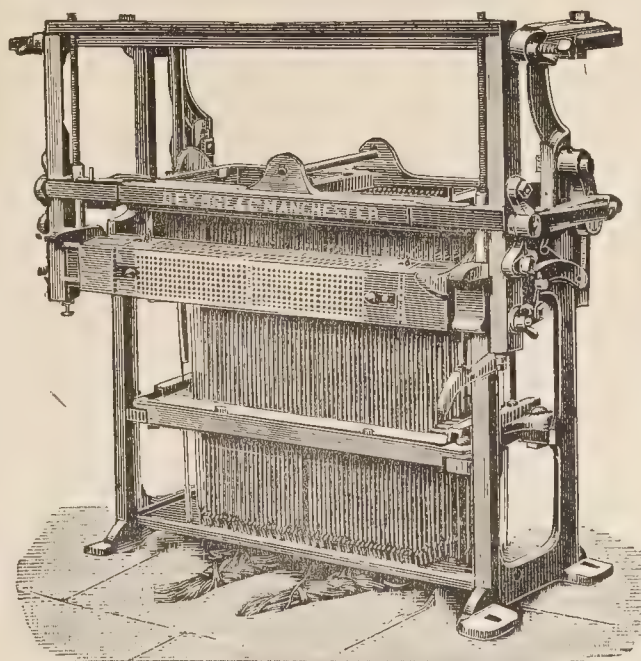
MESSRS. DEVOGE AND CO., MANCHESTER.

The exhibit of this firm, who, by the way, claim to be the oldest firm of jacquard machinists in the world, is specially interesting to manufacturers of fancy goods, embracing, as it does, samples of the most important varieties of jacquard machines in use. Since the invention of the jacquard machine, numerous improvements have been made, and the elaborate machines now in use are, therefore, very different in appearance to the crude machine of Jacquard's day. The exhibits, on Stand 327, are:—1. A loom fitted with a 400s double lift, double cylinder jacquard (see illustration below), weaving a 30-inch cotton brocade at the rate of 200 picks per minute. Although



Double Lift, 400s (Two Cylinders). (Swing Motion).

running at such a great speed, there seems to be no undue strain on either jacquard or harness, and the cloth we saw woven was as perfectly made as cloth could be. This jacquard machine has two sets of hooks and needles, and the two cylinders work alternately, the odd cards passing over one, and the even cards over the other, cylinder; practically it is equal to two single lift machines, and is capable of working at twice the speed. For cotton, linen, and other manufacturers, who wish to run at the highest possible speed, we should say this is undoubtedly one of the best jacquard machines extant. The harness, also the work of the exhibitors, who are makers of card-cutting machinery as well, we should not omit to mention, as we never saw one more neatly and perfectly made, and with a badly made harness it is impossible to produce perfect cloth. 2. A 400s double lift, single cylinder jacquard, which is largely used in the cotton, mixed goods, and other trades, when a great speed is desired. This class of machine will run at 180 or 200 picks per minute, but the usual rate is about 170 or 180, this being found the most practicable speed for turning out good cloth. This machine is preferable to the single lift for weaving silk goods, although a great speed is not a desideratum in silk manufacturing; but, in consequence of there being two sets of hooks which lift alternately, by its use, a minimum of vibration and strain on the warp is ensured. 3. A 600s single lift



Single Lift (Swing Motion).

jacquard, with swing cylinder motion, such as is used in weaving silk, cotton, and other classes of goods, when a high speed is not necessary. This machine is generally used for making wide goods, also for figured lenos, and will run at 120 picks per minute satisfactorily. 4. A 400s single lift jacquard, same as No. 3 in every respect except the cylinder motion, which is horizontal instead of swing. This machine does not stand so high as the swing motion, and is, therefore, useful in weaving sheds in which the roofs are not lofty enough to admit of the other class of machine. It is used for the same purpose as the swing motion, and will run at the same speed. 5. An 812s jacquard, for use in manufacturing lace curtains. This machine is a finer gauge than jacquards which are used in ordinary weaving, and must require extreme care on the part of the maker; the parts being so fine, everything is

required to be made and fitted to a nicety to ensure correct working. 6. A 1200s Devoe and Co.'s improved rising and falling double-shed jacquard. This machine has been specially invented for weaving heavy goods, such as carpets, shawls, coatings, &c., which require a deep shed in weaving, so as to admit the large shuttles which it is necessary to use. The griff is constructed in such a manner that the hooks, which are not lifted, are depressed instead of remaining stationary as in ordinary jacquard machines, thus making the shed double the usual depth. The whole of the machines are of a thoroughly practical character, and calculated to do the work for which they are each specially made in a satisfactory manner. Undoubtedly they will attract much attention from those who are specially interested in the production of fabrics into which design enters largely. The above machines are only specimens of a few of the classes of jacquards this firm manufacture, their business embracing a varied description of machinery specially adapted for manufacturers producing almost any kind of goods of a fancy character. The exhibits are all well made machines, and cannot be praised too highly; they reflect great credit on the makers, and cannot fail to give satisfaction to users of them. For illustrations of the various kinds of jacquard machines made by this firm see their double-page advertisement in front part of this number.

MESSRS. WATSON, LAIDLAW AND CO., GLASGOW.

This firm, engineers in Glasgow, show a variety of machines of the kind known in the textile trades as hydro-extractors. These are in different forms and sizes according to the special kind of work they have to do. This exhibit will be especially interesting to wool growers, and all those connected with the manufacture of woollen, worsted, cotton, silk, and flax; and to spinners and manufacturers generally who wash or dye their material at any stage; dyers of all classes of goods, bleachers, printers, and finishers of textile materials. The whole of the machinery is of high-class workmanship, and will be found most complete in every respect. In addition to these appliances, they also exhibit the Kingston pump, the safety governor, self-oiling bearings, and centrifugal friction pulleys. It would take up too much of our space to do justice to this exhibit, so we simply take three or four specimens which we illustrate, and from these leave our readers to judge of the excellence of this firm's productions. The illustration below is of a 48-inch suspended, or over-driven, hydro extractor, with

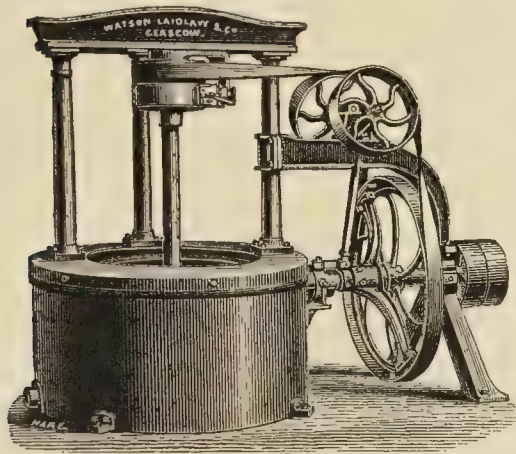


Fig. 1.

self-contained framing, countershaft, friction pulley, &c. This class is well adapted for the textile trades, and specially for dealing with large quantities of bulky and heavy goods. Objections are often raised to the ordinary type of over-driven machines, that the driving gear is cumbrous, and is placed so close to the top of the basket that it is very much in the way when putting in, or taking out, goods, and that oil and dirt are liable to fall down on the articles in the cage. A glance at the illustration will show that the machine is free from the first objection as the pulley upon the spindle is quite out of the way, and there is ample room for the attendant to place the goods in the machine and to take them out. There is an absence of bearings and fixings of any kind underneath the machine, and there is an extra depth of the basket, and, therefore, a larger space for the holding of goods. These are great advantages that should not be lost sight of by purchasers. As to the second objection, the working parts are so arranged that the oil, which is contained in a hollow spindle, cannot run away, and very little is consumed, there is thus no liability to damage the goods in the basket. The working parts are all practically in view, and it can be easily ascertained, therefore, at any time, whether they are in proper working order or not. Objections also are made to driving by belts, owing to liability to slip, and the trouble, and wear and tear involved in shifting, but these are counterbalanced by the use of a patent centrifugal friction pulley, Fig. 2.

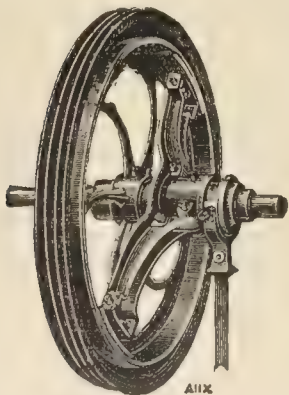


Fig. 2.

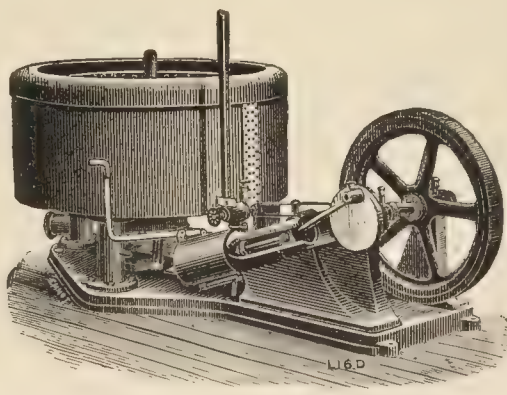


Fig. 3.

By means of this apparatus, which is automatic in its action, and has none of the screws or complicated mechanism of ordinary friction gear, all objections to the use of belts in this connection are removed. Whilst recommending the suspended or over-driven extractor, shown in Fig. 1, more particularly for dealing with large quantities of heavy material, this firm also make under-driven or, what they call, "pivot" extractors. Fig. 3 is an illustration of a machine of this kind which is shown at work. It will be noticed that it is driven by a small separate steam engine (which is in itself a portion of the exhibit well worth inspection); the makers being of opinion that this method of driving is by far the best and most

economical where it is not convenient to take the power from some main shaft. It will be readily understood that the "pivot" extractor may, if desired, be driven through the medium of the friction pulley as shown in Fig. 1, and also that the suspended machine shown in Fig. 1 may be driven by one of the special engines instead of the friction gear. Referring again to the centrifugal friction pulley, to which this firm invite particular attention as being an exceedingly simple and interesting device, it may be mentioned that, apart from the use of this apparatus in connection with the hydro-extractors, it is now being applied for driving many other classes of machinery, including dynamos for electric lighting. Fig. 2 is an illustration from a photograph of a friction pulley for ropes for this latter purpose. They also show a 2-inch "Kingston" pump, Fig. 4, capable of working under a pressure of 60 lbs. per square inch, or of throwing 2,000 gallons of water

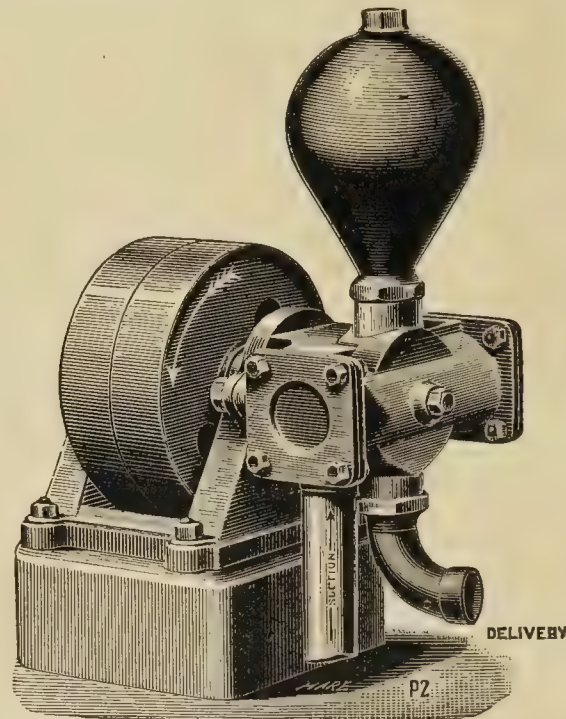


Fig. 4.

per hour. This pump, which is double acting, having a double reciprocating plunger, giving a positive displacement, actuated by a revolving roller—will be found extremely simple and efficient. It is made in different sizes, from one to four inches, with capacity from 500 to 8,000 gallons. They have also several specimens of Macfarlane's safety governor, Fig. 5, at their stand. There is one at work on the high speed steam engine, which is driving the pivot hydro-extractors; and another with the outer casing cut away, in order to show the movements of the parts, is also in operation. The following advantages are claimed for the governor:—Should the belt driving the governor slip off or break, whilst the

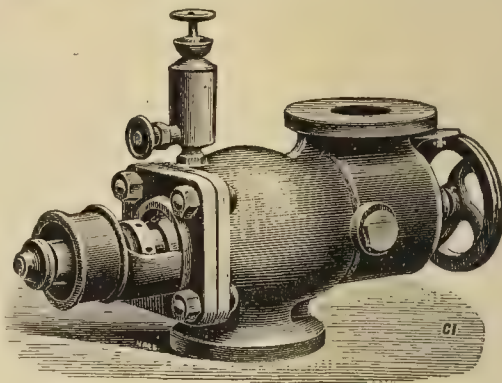


Fig. 5.

engine is working with steam valve full open, the governor will shut off the steam and stop the engine. The centrifugal part of the governor being in the steam, it acts directly on the throttle, without being affected by the variable friction due to stuffing boxes, joints, &c. It is consequently much more sensitive, efficient, and reliable. Further, as the working parts are lighter than usual, the governor is equally as efficient on high-speed engines, as on those of ordinary speeds. The oil used for lubricating the governor passes into the steam cylinder—separate lubricators for the latter being therefore rendered unnecessary. There are from 25 to 40 per cent. fewer parts, as compared with many others of its class, and every part is easily reached for examination.

MR. JAMES HOWORTH, FARNWORTH, NEAR MANCHESTER.

At Stand 499 this firm show a Patent No. 2 Radial Ventilator, (Fig. 1), driven by motive power, for the ventilation of weaving sheds, mills, gassing rooms, sizing rooms, drying stoves, bleach works, dye houses, buildings, and works of every description, capable of abstracting from 1,000 to 30,000 cubic feet per minute of steam, dust, hot air, gases, dirt, waste flyings, and other injurious effluvia. Mr. Howorth also exhibits Patent Horizontal Screw Exhauster (Fig. 2), and a Patent Horizontal Exhauster and Propellor (Fig. 3), which are used for the

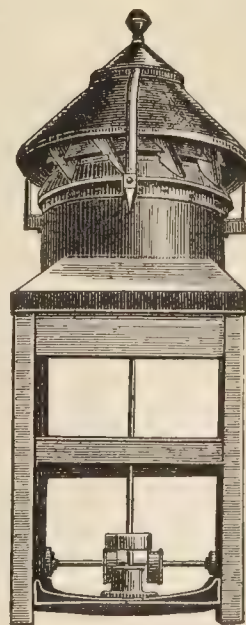


Fig. 1.

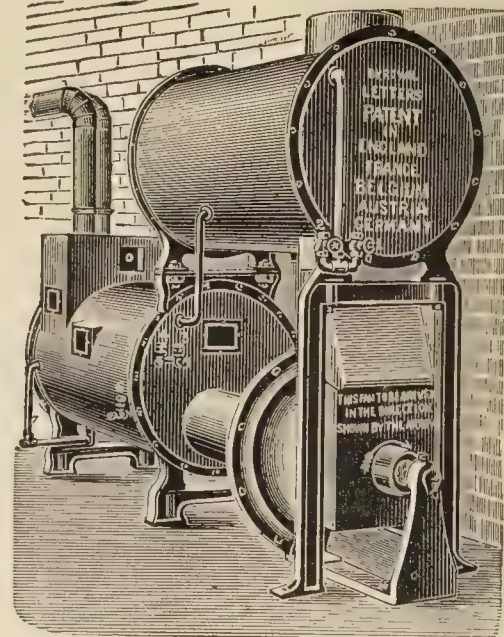


FIG. 5.

same purposes as the No. 2 Radial Power Ventilator, but applicable more especially for the lower stories of mills or works, through the window or through a wall without tubing; they will work equally well with the feet, or brackets, bolted to the ceiling or beam in a room. By the employment of an elbow, the saving of a counter shaft is effected. When fixed vertically, as in weaving sheds, &c., the new Patent Fixed Hood Cover is used. On the Stand is a Patent Humidifier and Heater (Fig. 4); an appliance for admitting a proper supply of fresh air to take the place of the vitiated air abstracted by the exhauster in the card rooms, weaving sheds, and other works. In admitting the fresh air it can be warmed, cooled, moistened, or dried, as required, and regulated and directed so that no perceptible draught is felt by the occupants of the

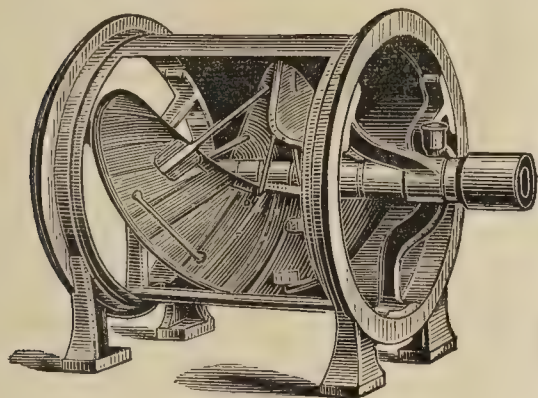


Fig. 2.

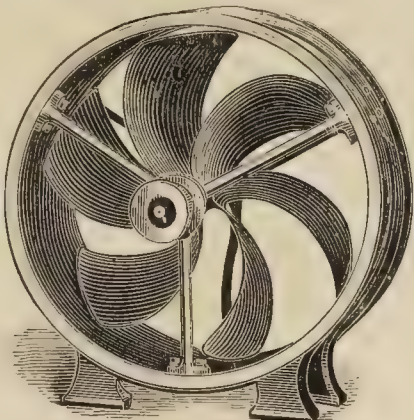


Fig. 3.

room. Lacy's Patent Humidifier and James Howorth's Patent Air Heating and Cooling Chest combined (Fig. 5), is also exhibited, for ventilating, heating, cooling, and moistening the atmosphere in all kinds of public buildings, weaving sheds, factories, &c., &c. This patent finds application for many purposes, and will be of great use in all branches of industry where the influence of temperature is of importance. The air, by its passage through the water flowing over the perforated sheet, takes the temperature of the latter, thus providing either warm or cold,

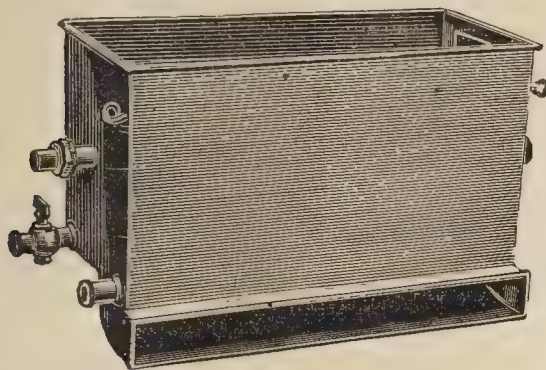


Fig. 4.

and in every case purified, air. It is a remarkable fact appertaining to this invention, that by employing, over the perforated plate, water of a temperature below 65° F., it will supply cool, dry air; a higher temperature of the water will thoroughly saturate the air, which may be further warmed by the admission of steam into the coils, whilst ice in the upper compartment will cool the air to almost any extent,

consequently supplying warm or cold, moist or dry, air. Manufacturers of textiles have largely adopted the humidifier, and its value is fully appreciated, the demand having steadily increased in the United Kingdom and abroad.

MESSRS. GOODBRAND AND CO., STRANGWAYS,
MANCHESTER.

This firm have a good selection of steam engines and pumps, all of which are well finished and well proportioned. They exhibit a quadruple acting steam pump, which is a noble looking piece of machinery. It has been designed to do light, as well as heavy, duty, and is arranged with a moveable eccentric to vary the cut-off in the steam cylinders, varying from one-eighth of the stroke for light duty to following the piston, to about eight-tenths of the stroke, and, with a boiler pressure of 60 lbs. per square inch, will work against a water pressure of 200 lbs. per square inch, and will discharge 78,500 gallons, or 350 tons, of water per hour. The stroke of the pump is regulated by cranks and crank shaft, with fly wheel, and is fitted, in every respect, as in a pair of steam engines; with the cranks set at an angle of 45 degrees, will start at any point of the stroke. The eccentric is constructed as follows:—A disc, having ears as guides for the eccentric, is keyed to the crank shaft, and the eccentric itself is simply an annular ring to receive the clips for coupling up to the valve rod, and is prepared with two lugs to work freely in the eccentric groove, turned on a hand wheel, which is made free to turn round on the crank shaft, and when turned round, in a direction indicated by the arrow on the disc, will alter the position, or throw, of the eccentric, suiting the duty of the pump, with an economical use of steam unequalled by any direct acting pumps that have no cranks or crank shafts. This eccentric can be easily applied to any existing pump having a crank and crank shaft. The cut-off arrangement, by the moveable eccentric, has been adapted for its convenient position and being easy of access. They show also a quadruple acting stationary steam fire engine, of the same type as the one just described, with cranks regulating the stroke, and set at an angle of 45 degrees, to start at any part of the stroke; it is capable of discharging 38,900 gallons, or 173½ tons of water per hour; working barrels are 7-inch diameter by 9-inch stroke. They show a horizontal non-condensing steam engine, with cylinder 14-inch diameter by 28-inch stroke, and cut-off motion variable by hand. The governor is of the "Porter" type, high speed, sensitive in action; the cylinder is finished with polished mahogany lagging. They exhibit a double diagonal high pressure steam engine, with cylinder 10-inch diameter, with marine crank shaft, the jaw of the connecting rod, at the crank

pin end, is made entirely of gun metal, which also forms the oil cups as well as the top and bottom bearings. The governor in this engine is also of the "Porter" type, but neatly contrived to be direct acting to, and fixed upon, the equilibrium valve.

The Yorkshire Jubilee Exhibition at Saltaire.

MESSRS. O. B. LISTER & BRO., DUDLEY HILL,
NEAR BRADFORD.

Since the combing machine was first invented, the minor improvements that have been effected, and the additions made to its mechanism, have been innumerable. Many of these have proved of the greatest utility, whilst others, after having been tried for a time, have been discarded as failures, but, taken as a whole, this combing machine has been brought to a state bordering on perfection, and it seems impossible, to those who are not intimately acquainted with its working, to add to, or to improve, the machine, so as to make it of more value to the textile trades than it has been recently. But, at this Exhibition, a minor portion of the combing machine shown has been so much improved that thirty per cent. more work can be guaranteed by its use. This important improvement has been effected in the "Dabbing Brushes" by Messrs. Lister and Battye, and is being shown by Messrs. O. B. Lister and Bro., of Dudley Hill, near Bradford, upon one of Noble's combing machines, at the Stand occupied by Messrs. Taylor, Wordsworth and Co., of Leeds. There are many advantages connected with this dabbing motion. In the first place, smaller brushes than those ordinarily used will perform the work of dabbing—thus reducing the cost in this respect—and it is guaranteed that both the brushes and leathers will stand more wear and tear, and, therefore, last longer than is usual. The parts of the motion are all turned and fitted to gauges, and the working parts are self-lubricating. The value of the latter appliance will be evident when we state that, when once charged with half a gill of oil, the motion may be run for a week without being touched, and with a waste of only four drams. A much higher rate of speed than usual can also be had with these brushes, a rate of one thousand dabs per minute can be attained, and it will, therefore, be at once seen, by those versed in this class of mechanism, that with such a speed more effectual dabbing is the result and, consequently, clearer work must be made, and circles can be thus run with ease and safety three to three and a quarter revolutions per minute. With these advantages, the cost of production in the combing operations are considerably reduced, in fact, Messrs. Lister and Bro., who are combers of wool of various kinds, state that they have effected a saving of ¼d. per pound on all tops they have made since they commenced to use this motion. This being the case, it is not a matter of surprise that many of the leading firms in the trade have already had the appliance fixed to their machines in order to compete successfully with rivals in this branch of the textile industry. So sanguine is this firm of the utility of their improvement that they are willing to fix the motion to any Noble's Comb on approval, thus enabling combers to test its capabilities thoroughly before purchasing. Those interested in this class of machinery should by all means see it working at the Exhibition.

THE SINGER MANUFACTURING COMPANY'S CARD LACING MACHINE.

Manufacturers who visit the Yorkshire Exhibition should spend a short time at the Stand of The Singer Manufacturing Company, No. 130, bottom of Court V, where may be seen one of the most novel and useful machines we have yet examined. It is well known, to all who use jacquard machines, that card-lacing has hitherto been done by hand. This is now superseded by a machine made by the above company which we propose to briefly describe, and for our purpose we will suppose our attention to be directed to lacing those cards known as three-hundreds. These will, of course, require lacing in the centre and at each end. To accomplish this there are arranged upon a suitable frame-work, and at the top of the machine, three strong sewing machines, at the required distances apart, and each holding a reel of twine. Immediately under these is a shaft bearing three wheels, each corresponding to a machine above it. These are fitted with steel pegs, at regular distances, upon which the cards are placed in the same manner as upon an ordinary card-lacing frame, and a semi-circular spring is fitted over each wheel; this grips the eards whilst in the act of being laced. A small plate is also placed against each spring, (underneath which is the shuttle) forming a support for the cards. From the bottom, a reel of twine passes upwards and acts in a manner similar to the thread on a spool in an ordinary sewing machine. The cards, fitted upon the pegs, revolving upon the wheels, are carried under the needles, and being laced, fall away on the other side. The machine is simplicity itself, and can be attended by any boy or girl. It can be worked either by treadle or power, and, we should think, will lace a set of cards in half the time required to lace one side under the old system. Every part, being adjustable, can be moved about, and thus a machine will lace any size of cards, whether three, four, six, or twelve hundreds, as extra wheels can be had, with the steel pegs the requisite distances apart, for those who use cards varying in width. We venture the opinion that this is an excellent machine, and one which every manufacturer using jacquards should

have, the work resulting being more accurate, expeditious and economical, than is possible under the old system, whilst their first cost is not prohibitive. Any size of machine can be had, The Singer Manufacturing Company having lately supplied one with six needles and shuttles. The chief office of this company in the United Kingdom is 39, Foster Lane, Cheapside, London.

MR. T. METCALFE, BRADFORD.

The wrought iron pulleys for driving the dynamos have been supplied by Mr. T. Metcalfe, St. James's Iron Works, Moss Street, Bradford. There are thirteen in number, five of which are double-armed, varying in diameter from 2 to 5 feet, and 13 in. wide on face; and eight single armed pulleys, varying from 2 ft. 6 in. to 5 ft. 6 in. in diameter, and from 5 in. to 10 in. wide on face.

MESSRS. JOHN WHITE AND SONS, BINGLEY.

The whole of the belting, as we stated in our last number, has been supplied by Messrs. John White and Sons, Bingley, as well as that used for driving the shafting. There are twelve belts, varying from 8 to 12 in. in width, of double leather and copper sewn. This firm has also a good exhibit at Stand 169, Court I, consisting of walrus hide for polishing main driving belts, triangular and square leather ropes, machine belting, pump butts, strap butts, hard and soft drawing and spinning butts, combing leathers for silk, wool, jute, flax, &c.; white, brown, and horny laces, and general mill furnishings.

MR. JOSEPH SHAW, LOCKWOOD, HUDDERSFIELD.

It is universally admitted by those who have any practical knowledge in the use of gas, that a regulator, or governor, is now an absolute necessity, and that anyone using gas, especially in large quantities, is generally paying money for that which might be saved by the use of an efficient regulator. Gas gives its maximum of illuminating power when it issues from the burner with little or no pressure. The constantly varying pressure of gas is well known to everyone, and is partly owing to the irregularity of the pressure in the street mains; it is more particularly so in some places where the mains are too small to supply the great and fluctuating demand for mills and other works, and this fact has compelled gas companies to increase the pressure at the works, ranging from tenths to thirty-tenths, and the consumption is, consequently, augmented in proportion, simply because it is impossible to burn all the gas passing through the burner at such a pressure (the most economical pressure at which gas can be consumed being five-tenths), and, what is still worse, with every increase of pressure, over and above five-tenths, the illuminating power goes on decreasing. Thus it is quite clear that the consumer is the great sufferer by an excessive pressure, and hence so many complaints of bad gas and heavy bills, and all this in the face of such great reductions in the price of gas! The remedy for all this is undoubtedly the use of a practical regulator, and Mr. Shaw, who has fitted up the Exhibition with his patent improved self-acting gas regulator, or governor, has proved that this appliance is the one thing needed by all gas users. It has been actually demonstrated that it is efficient in every respect. Mr. J. Shaw claims for it:—Simplicity of construction, durability and non-liability to derangement, effectiveness in controlling the pressure, increased illuminating power, perfect combustion, perfect uniformity of flame, purity of atmosphere and reduction of heat. These advantages ought to induce all users to patronise this regulator. In addition, Mr. J. Shaw exhibits patent joints for coupling steam, gas and water pipes. This union joint will couple pipes at any angle of not less than 60 degrees, or in other words will join together pipes fixed in any position not having more than four inches to the foot of a divergence from a straight line, which is more than is required for ordinary purposes. The expansion and contraction of steam and hot water pipes form one of the greatest difficulties with which an engineer has to contend, and especially with the breaking and consequent leaking of the fast joints, such as the coupling of a pipe to a boiler, cistern, or fixed machinery of any kind. The adaptability of this universal union to such cases is one of its special features, as it will swivel on the joint and accommodate itself to the continually altering position of the pipes, and be perfectly steam tight. Mr. J. Shaw also shows brass work of other descriptions. At the Manchester Jubilee Exhibition he has also a similar display of his manufacture in the machinery department.

MR. JOHN PETRIE, JUNR., ROCHDALE.

This firm shows a case containing a great variety of greasy and burry wools, and also corresponding wools after they have been scoured, extracted, and washed, by their patent machinery. Unfortunately, the facilities for showing this class of mechanism were not to be had at Saltaire, the process requiring special preparation on the part of the exhibition authorities, Mr. Petrie has, therefore, to be contented with exhibiting specimens of wools in the different stages of scouring, extracting, and washing. As, recently, an opportunity of seeing a whole set of machinery in operation was

afforded us, we propose to describe it. The first was that of carbonizing or destroying burrs in wool, on a new system, by the application of chemicals by one continuous process. The burry wool was first fed into one end of a tank or bath, (this contained a chemical preparation) it was then gradually carried on, by means of rakes, and out at the opposite end, by which time, the burrs were effectually destroyed, leaving the fibre of the wool unimpaired. The wool was then carried forward to be washed; this was done by a machine which it is almost superfluous to describe, as Mr. Petrie's washing, scouring, and drying machines are now so well known by users of this class of mechanism. The wool was afterwards put into their continuous wool drying machine, thus completing the operation. The wool, as stated above, came out of the operation uninjured and in good condition, there being no tendency to weakness in the fibre, nor the slightest appearance of "milling." Undoubtedly, the machines do their work most satisfactorily, and they ought to meet with much favour from those who use Botany, combed, and short wools. We may add that the drying machine, which is continuous in feed and delivery, will dry at least 5,000 lbs. weight of wool per day, the wool being weighed after the washing and drying processes. The machines for all the operations can be seen at work at Rochdale by applying to Mr. J. Petrie, who will be pleased to afford every facility to those interested to judge for themselves of their capabilities.

Cotton and Silk Spinning Machinery.

We have pleasure in drawing the attention of cotton and silk spinners to the great variety of machinery manufactured by Messrs. E. V. Cooke and Co, whose works at Windsor Street, Regent Road, Salford, are within easy walking distance of the Exhibition. Our representative has recently been conducted through these works and, therefore, a few remarks will not be out of place here. Messrs. E. V. Cooke and Co. inform us that they have not deemed it advisable to make a show at the Exhibition at Old Trafford, but that any of our readers interested in their many improvements in silk and cotton spinning machinery can have them shown and explained to them by appointment, at their works. We are informed that they are in possession of the original patterns used by the late well known firm of W. Higgins and Sons, for the manufacture of patent drawing frames, slubbing, intermediate, roving and jack frames, spinning and doubling frames, and that they have, within the last eighteen months, supplied these machines to many of the largest cotton and silk spinners at home and abroad. The following advantages are claimed for slubbing, intermediate, roving, and jack frames, viz.:—Their extraordinary durability at high speeds; their facilities for cleaning and oiling. The spindle, being quite free, it can be drawn out at once, as there is neither pinion nor set-screw to adjust; the impossibility of any binding in the spindle or tube, as the spindle revolves free in the tube, which does not move, and is in its turn connected with the rails by compound swivels; and the great production per spindle.

Weighing Machinery for Textile Manufacturers.

We have had submitted to our notice a neatly got up and well illustrated catalogue of the various kinds of weighing machinery made by Messrs. Hodgson and Stead, Egerton Iron Works, Regent Road, Salford. There are more than a score varieties of these machines given in this catalogue; we mention a few claiming particular attention. The standard weight machine, specially adapted for wool and cotton bales, and for other bulky articles common to textile factories—these are strong, well finished and durable machines, and are guaranteed for perfect accuracy; the counter weighing machine, a neat apparatus for weighing warps, yarns, piece goods, etc.; platform weighing machines, also designed for factories or warehouses, these can be had stationary, or mounted upon wheels, and another variety of the same machine has folding wings for accommodating loose or bulky materials. Another machine is supplied with wheels and drag handles, and is specially useful as a travelling machine for weighing articles inconvenient to move any distance; then there is the platform weighing machine—this is sunk to the level of the floor, and is for use in cases where heavy baled or boxed goods are to be weighed. The self-indicating weighing machine, patented by this firm in 1886, is a marked advance upon anything which has been done in this direction. It gives an accurate and reliable indication of a load with remarkable promptness. It is free from complicated parts, the presence of which are an objection, as they so often get out of order, and thus cause the machine to be inaccurate. Weighbridges, for use in factory yards, for weighing coals, goods, and other loads, are a speciality of Messrs. Hodgson and Stead, and are noted in their catalogue in several varieties. A noteworthy feature in these machines is, they are so constructed as not to require any masonry foundations, and can be fixed in a few hours, and are at any time readily removed and refixed. Those of our readers requiring any class of weighing machines should see Messrs. Hodgson and Stead's catalogue.

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Notices.

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The Proprietors will feel greatly obliged if any of their readers, in making enquiries of, or opening accounts with, Advertisers in this paper, will kindly mention the *Journal of Fabrics and Textile Industries* as the source from whence they obtained their information.



The Manchester and the Yorkshire Exhibitions.

These Exhibitions continue to be great sources of attraction to thousands of visitors, the machinery sections claiming a great share of attention. Our efforts in placing before our readers, in our last issue, descriptions of some of the most interesting machinery, &c., exhibited have been well received and appreciated, and we, therefore, continue our descriptions in this number, together with a short account of the life, and a portrait, of Mr. Wm. Crighton, of the firm of Messrs. Crighton and Sons, Manchester. Visitors to the silk section of the Manchester Exhibition will find much to interest them, as, just now, it is to be seen at its best. In the entomological collection, exotic moths are daily emerging from the cocoons.

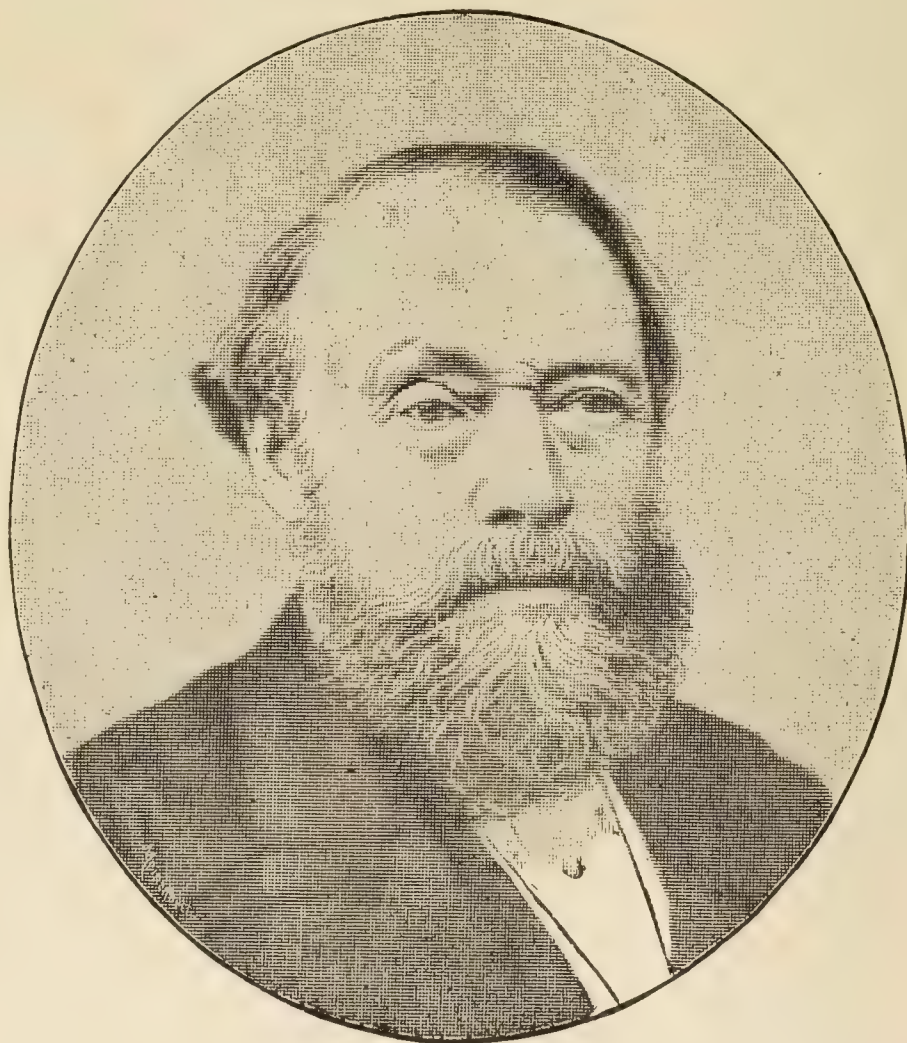
MESSRS. MATHER AND PLATT, SALFORD.

Although much attention has been given to the transmission of power by electricity, and to its application to electrical tramways and railways, and the utilization of water power at a distance, the distribution of power by this means in workshops, factories, ship-yards and similar places, has received comparatively little attention. At the same time, there is no doubt that there is, in this direction, a very wide field for the use of electrical motors. This is especially the case in those works where, for various reasons, the principal machines and tools are not driven from one common system of shafting, but have each an independent engine. Such is the case in printing works, where each printing machine is driven by its own engine, also in paper mills, in rolling mills, and in many shipbuilding yards, and other large engineering shops, where the heavier tools are necessarily distributed over a large area, and where it is important to have complete control over each individual tool. It is with the special intention of showing the applicability of electrical driving in these cases, and its advantages, that Messrs. Mather and Platt have designed their exhibit at the Manchester Exhibition. As a typical case, and one in which the conditions to be met are most stringent, they have chosen one of their ten colour calico printing machines for printing calico with ten colours simultaneously. If electrical

driving can be proved to be advantageous and economical for complex machines of this class, where a slow speed, under the most perfect control, and at the same time high efficiency are essential, there is no doubt about its applicability in other cases, where the conditions are less exacting. A large printing machine, similar to the one exhibited, would be driven under ordinary circumstances by a double cylinder diagonal engine, with cylinders 10 inch diameter, 12 inch stroke, running at about 180 revolutions per minute. The star wheel of the printing machine, when printing at full speed, runs at 12 or 13 revolutions only, it is, therefore, necessary to reduce the speed by gearing. But where a dynamo motor is used in place of the steam engine, the speed of the motor must be much higher in order to obtain good efficiency without unduly increasing the size and cost of the motor. The motor employed at the exhibition runs at 700 revolutions, hence the speed must be reduced in the ratio of 56 : 1. This is accomplished by a combination of belt and spur gearing. The dynamo shaft is fitted with a pulley 16½ inch diameter, driven by means of a short belt on to a pulley 54 inch diameter. In order to increase the grip of the small driving pulley on the belt, Messrs. Mather and Platt's system of a loose "jockey" pulley is employed. The jockey pulley runs loose on a stud fixed on an arm projecting from the dynamo bed, and bears against the slack side of the belt. By an arrangement of worm and wheel, the arm can be raised or lowered, moving the loose pulley with it, and, consequently, increasing or diminishing the angle at which the belt is bent over it. By this means, the surface of contact between the belt and the driving pulley can be increased, and the slack of the belt taken up, thus, at the same time, giving an adhesion equal to that of a long belt, and providing means for taking up the slack as the belt stretches. The speed is further diminished by a train of two internal spur wheels and pinions. The combination gives a most effective drive, perfectly noiseless, occupying no more space than the gear for reducing the speed of a steam engine, and under perfect control. The printing machine is of Messrs. Mather and Platt's latest design for printing cloth up to 34 inches wide, with from one to ten colours simultaneously, at a speed of 30 yards per minute. The machine is fitted with traverse motion for the doctors, long rollers, and steam drying. To work it at full speed, from 15 to 20 horse power is required. In order to set the pattern, it is essential that the speed of the machine should be so under control that it can be made to "creep" round and to be stopped in a fraction of a revolution, so as to enable the printer to see that the rollers, each printing one colour, are properly adjusted relatively to one another. With a steam engine, this is effected by a stop valve on the steam inlet, the valve spindle being fixed conveniently accessible to the printer. But a steam engine must have a flywheel, and the valves cannot be instantaneously closed, so that the machine cannot be stopped as quickly as might be desired. A dynamo motor, on the other hand, having no dead points, requires no flywheel, and the current can be instantaneously shut off, and, consequently, the machine brought to a stand more rapidly than is possible with steam engine driving. The speed is regulated by a switch board, placed at one side of the machine, at the printer's right hand, arranged to insert resistance in the circuit, and so lowering the speed of the motor to any desired extent. The whole floor space covered by the motor, driving gear, and resistance, is somewhat less than that which a steam engine would take; a point of much importance in print works. The current is conveyed to the motor from a generating dynamo by an insulated copper cable, carried under the floor of the Exhibition buildings. The generating dynamo is fixed in the dynamo house immediately adjacent to Messrs. Mather and Platt's pair of vertical engines and dynamos for lighting the Fine Art section. The distance from generator to motor is 45 yards, but this might be greatly increased with very slight increase in the proportion of power loss in transmissions. The generating dynamo is also of the "Manchester" type, and is a similar machine to the motor, capable of generating 25 to 30 electrical horse power, at a speed of 950 revolutions per minute. It is driven by a double cylinder diagonal engine, with cylinders 8 in. diameter, 10 in. stroke, and running at 180 revolutions per minute, with a short belt, driving on the same principle as that used with the motor. Although a separate engine and generating dynamo are provided, this is not necessary, and the current could be obtained from any dynamo of sufficient power used for lighting or for working other motors. Arrangements have been made for connecting the motor cables to any of the four dynamos working the incandescent lamps in the Art galleries. The whole loss in conversion from mechanical to electrical power, in transmitting the electrical power and reconvertng into mechanical power, does not exceed 25 per cent. This is far more than compensated for by the fact that the engine driving the generating dynamo can be worked under the most economical conditions, which is impossible with an engine driving direct. No better illustration of this could be afforded than the fact that actually a smaller engine is employed for driving the generating dynamo than would have been employed had the printing machines been driven direct. In a large print works, where there are considerable numbers of independent machines, the advantages will be still more conspicuous. For, in place of a separate small engine to each machine, working necessarily with low steam pressure, often with considerable back pressure, and generating under conditions where high efficiency is impossible, a single high-class engine can be used, working under the most favourable conditions, with high pressure steam, high expansion, proper automatic cut-off valves, giving the highest efficiency. This engine would be employed to drive one or more generating dynamos, which might also be employed for lighting purposes, and, from these, cables would be taken to each independent machine worked by its own motor. Such a system has, moreover, the advantage of avoiding the necessity of steam and exhaust pipes, and drain pipes for the engines running throughout the building—a point of considerable importance when the operations carried on require great cleanliness. Briefly, the advantages of the system of electrical motors for the distribution of power may be summarised:—1. Greater economy in consumption of fuel. 2. More perfect control over each individual machine. 3. Greater cleanliness. 4. The availability of the plant used for the distribution of power for electric lighting and other purposes.

William Crighton, Esquire.

The portrait we give in this issue, is that of Mr. William Crighton, of the firm of Messrs. Crighton and Sons, who are exhibiting Higgins' Patent Express Roving Frame, described in our last number, and who are carrying on business at the Castlefield Ironworks, Manchester. The name of Crighton is intimately associated, not only with the latest improvements in cotton machinery, but also, with the earliest inventions which still survive as indispensable to cotton spinning. As far back as the close of the last century, his father, the late Mr. John Crighton, a native of Scotland, came from Glasgow to Manchester, in which city he founded the present business. It was about the year 1814, that he (Mr. John Crighton) invented the scutcher lap machine, prior to which date, Mr. Snodgrass, his contemporary—another Scotchman—had been the only maker of scutchers, which machine, it remained for Mr. Crighton, through his invention, to complete with a lapping apparatus, and it is a singular fact that no improvement in this process of manipulating cotton has been made up to the present time. At an early age, the subject of our portrait, entered the workshop of his father, and soon grasped the details of a mechanical life; it was about this time that the late Sir Joseph Whitworth was serving his apprenticeship as a mechanic, under the fostering care and guidance of Mr. John Crighton, whose genius and talent were so highly appreciated by men of his time. In the long to be remembered winter of 1862-3, when the American cotton supply was cut off in consequence of the terrible civil war then devastating America, our factories were all at a standstill, our workpeople thrown into enforced idleness and starvation, but, happily, it was a mild season, still there were much suffering and widespread want, and the nation generously contributed more than a million pounds to a relief fund. It was at this time that the subject of our notice came most prominently before the public, having just previously secured *Letters Patent* for the invention of his world renowned "cotton ascending opener." Prior to this, Indian cottons had been entirely discarded by the majority of cotton spinners, and the few, who did use them, could only do so for the lowest and inferior classes of yarn; what, therefore, must have been the exultation of the people, at the critical period above referred to, when it was found that Mr. Crighton's invention, though made to suit all classes of cotton, was the only one which could adequately cope with the short matted fibre then imported from India. The demand for the Crighton opener became so enormous that it was utterly impossible to keep pace with it. Mills that were standing idle purchased these machines, reopened their doors to their starving workpeople, work was busily resumed, and much of the suffering was alleviated thereby. Finding, in consequence of the merits of this machine, the demand for Indian cottons rapidly improving, and as it now became a paying matter with the Indian planters, they turned their attention to the cultivation and improvement of their crops, and what was, prior to this invention, sold at 2d. per lb., soon realised 4½d., per lb. It is estimated that India alone has reaped, as a direct benefit from the invention of this machine, a profit of several million pounds sterling, without taking into consideration the profit accruing to this country. As soon as the demand for these machines for Indian cotton had been met, Mr. Crighton turned his attention to the improving and perfecting of his invention, and so successful has he been in this direction, that it is now as much used by spinners of American and Sea Island cottons as by those of Indian cottons. A modification of this machine received the highest award—silver medal—at the Bradford Exhibition of 1882, for opening and cleaning wool, and a recent invention, patented by a member of the firm, has eminently adapted this machine to the requirements of the woollen and silk trades. There are many other inventions with which Mr. Wm. Crighton's name is connected in the cotton spinning world, and the whole of his life has been devoted to this branch of industry, but more especially to the scutching department, doubtless owing to the interest evinced and fostered in him by his late father. Many years since, the firm took up the spinning department in the making of their self-actor mule, which is so well known as to need no comment here, and more recently, indeed, within the last two or three years, have added to that the making of card room machinery, especially that of drawing, slubbing, and roving frames on Higgins' patent express principle, the whole of the



patents for which they have purchased from Messrs. W. Higgins and Sons, for this country, and now exercise the sole right in the making of these frames so highly appreciated by the trade. Mr. Wm. Crighton has now practically retired from business, although his name is still associated with the firm. We saw him a few days ago, and were pleased to observe that, although of advanced years, he still remains apparently as active and vigorous as of yore.

MESSRS. WALTER T. GLOVER AND CO., SALFORD.

One obtains a fair amount of knowledge as to the numerous applications of electricity to scientific, as well as to industrial, purposes by an examination of the variety of forms that iron and copper assume when manufactured for electrical conductors. On the Stand, No. 582, Messrs. Walter T. Glover and Co. show hard drawn iron and copper wire, used for overhead lines for telegraphic as well as telephonic purposes. These wires being cotton braided are protected with a preservative compound, and are much used by the Post Office and Railway Companies. Telephonic multiple cables, up to 100 wires, insulated and constructed to counteract induction, are to be seen, and also every variety of wires that it is possible to conceive of for various purposes, insulated with cotton, silk, gutta percha, and other non-conducting materials. Electric lighting, which has now become one of our most important industries, demands a vast amount of care and attention in the manufacture of the special wires employed; great purity in the quality of copper used, combined with efficient protection and insulation, being necessary, especially in such heavy cables as are required for incandescent electric lighting. Various samples of electric light wire are exhibited, from the elegant flexible silk covered cord used in highly decorated rooms, to the massive main cables connected with the dynamo. Moreover, it is interesting to note the fact that the whole of the electric lighting throughout the Royal Jubilee Exhibition has been completed by means of the wires and cables supplied by Walter T. Glover and Co. The arc lighting throughout the buildings and grounds, comprising over 500 Brush arc lights, the largest installation of its kind in this country, has been wired throughout by their cables. And the wires and cables used for the lighting of the Fine Art Galleries and of the other sections, universally acknowledged to be the most perfect and extensive incandescent installation yet attempted, have also been furnished throughout by this firm. It is interesting to note, as an extraordinary fact, that the length of the cables used for connecting the dynamos with these several sections is over nine miles, whilst the total weight of the copper employed for the conductors of the cables is more than ten tons.

MESSRS. DEVOGE AND CO., MANCHESTER.

In our last month's issue, in our notice of the exhibit of Messrs. Devoge and Co., at Manchester Exhibition, we omitted to call attention to their special comberboard slip which they have just introduced. It is not only a most ingenious invention, but one calculated to be of great saving in the cost of jacquard harnesses, whilst its simplicity must recommend it to manufacturers of jacquard goods. Very frequently the holes of the common comberboard slips become worn one into the other crosswise, necessitating the cutting down of the harness, whilst the thread is in comparatively good condition, and might last a year or two longer, but, owing to the slips being worn, it is impossible to continue weaving without re-harnessing. Messrs. Devoge's registered slip is bored in a peculiar pattern, by which arrangement the holes are twice as far apart, crosswise, as in the common comberboard slips, they will, therefore, last twice the length of time, in fact, until the thread of the harness is completely worn out. It is most suitable in the manufacture of cloths with 90 to 110 threads per inch, on a 400 machine, or 130 to 170 threads per inch, on a 600 machine, as, in the common slips for weaving these qualities, the holes are in such close proximity that they wear through before the thread of the harness becomes at all bad. At Stand 372, this firm show the special slip in use in their double-lift jacquard loom which is weaving at the rate of 200 picks per minute, and a practical man can see its advantages at a glance. We are informed that the cost is but trifling, and that Messrs. Devoge and Co., of 15A, York Street, Manchester, are the only firm entitled to make it, having protected their invention by registration. Manufacturers will undoubtedly find it more economical than the ordinary comberboard slip.

THE "LOWCOCK" ECONOMISER.

At Stand 414, in Machinery Annexe, Messrs. Arthur Lowcock, Limited, of Manchester and Shrewsbury, exhibit some different types of their well known Fuel Economisers. The exhibit is peculiarly interesting, as shewing the attention paid by the makers to what is required, in an apparatus of this class, to insure good and effectual working, and the best results as to economy in fuel. Without entering into the ordinary details of the Economiser, which are so well known, and which have been so repeatedly written about, we shall only touch upon the variations and improvements introduced in the "Lowcock" Economiser. We think we are right in presuming that there is no apparatus made which is better known or more universally adopted among steam users than the fuel economiser, especially in the manufacturing districts of Lancashire and Yorkshire, where it is quite the exception to see a boiler plant without an apparatus of this kind. Since the commencement of the career of this enterprising firm, some seven years ago, the Economiser (as made before) has undergone many important changes; although much the same in principle and design, the details and mode of manufacture have little in

common. We shall take the detailed improvements in the order in which they were offered to the public. The Spiral Scraper (for which the makers secured a patent) was first introduced in the early part of the year 1880, and so effectual has it proved in actual work, that it has not been deemed expedient to alter its form, except to lengthen the connecting piece between the upper and the lower scraping, or cutting edges, and to add a little weight to the scraper itself, and to the scraper bar, which was found an advantage, especially where the soot was of a damp or sticky nature. We give an illustration of this spiral scraper in Fig. 1, which we think our readers will be able to clearly understand. It will be noticed that the scrapers are spiral in form, and overlap each other, so as to

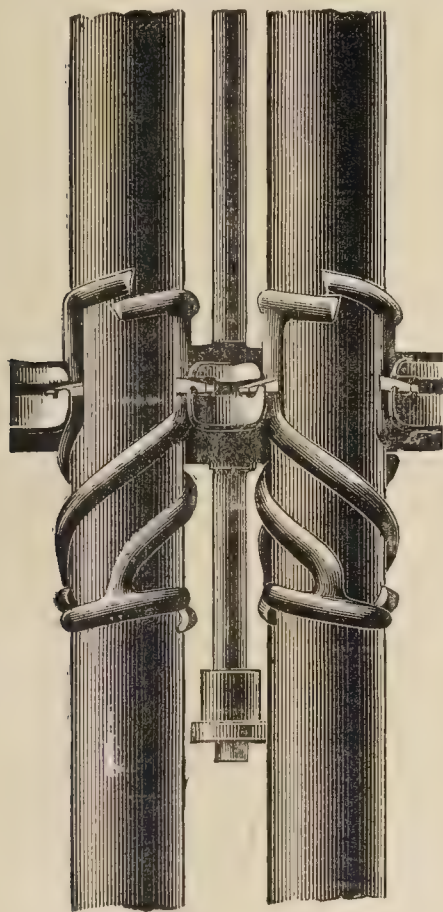


FIG. 1.

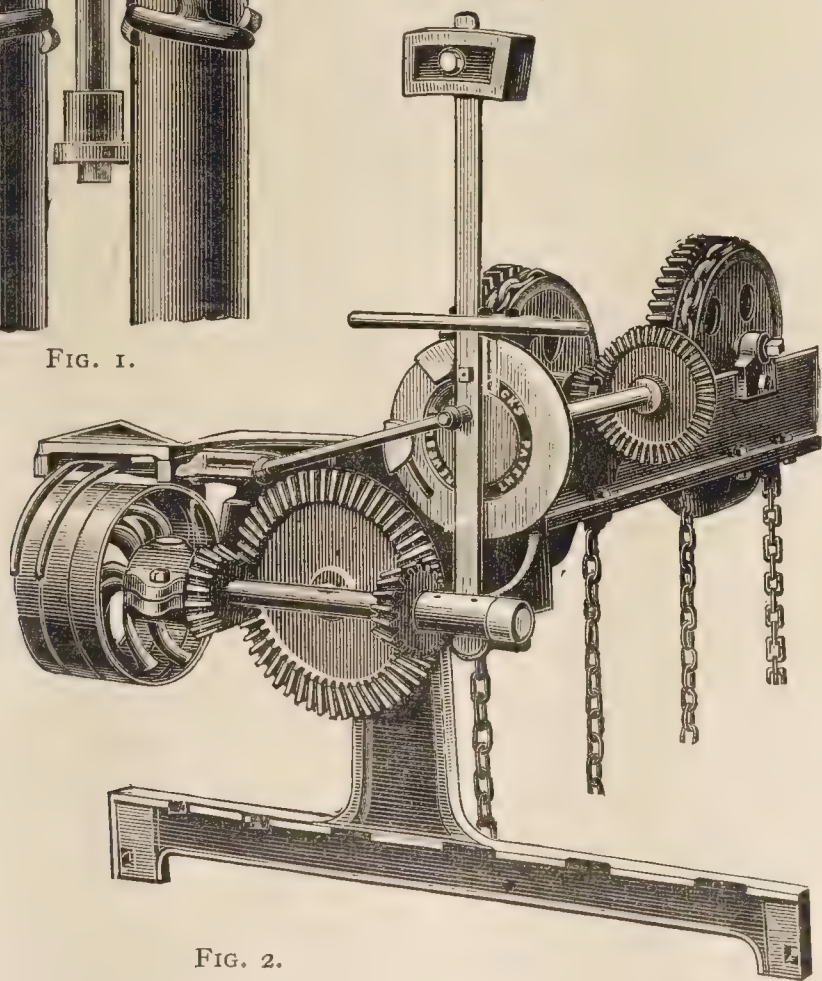


FIG. 2.

insure the whole surface of the pipe being properly scraped from top to bottom. The cutting edges are hardened, and the backs rounded off, in order to allow of the soot falling away as it is removed from the pipe. The scrapers are in moveable parts, three to each pipe, and the scraping edges of each scraper being connected spirally, and lifted with a tab placed nearer the top than the bottom, gives it a tilting action when at work, this keeps both cutting edges close against the surface of the pipe, and prevents the tendency to back off and to plaster the soot on the pipes when encountering deposits of a sticky nature. These scrapers are not found to wear away rapidly, as it might at first be supposed they would be likely to, from their keen scraping propensity. The peculiar shape will insure their effectual working as long as there is a particle of scraper remaining. We understand they are sometimes made of malleable cast iron, at a slightly additional cost. The gearing for driving the scrapers which is illustrated in Fig. 2 was a happy hit, on the part of the makers, in its simplicity and safe and sure working. By means of the patent positive reversing motion, no fear need be entertained of the scrapers standing still from the reversing gear failing to act, since, as long as the power for driving is applied, the motion must act regularly without any attention whatever, except an occasional oiling of the bearings. The makers confidently assure us that they have

never known it to fail. The vertical pipes (upon which the scrapers work) are simply the perfection of clean and smooth castings, and we cannot pass over these without a few remarks upon the way they are made, as redounding greatly to the credit of Mr. Lowcock. It is now some six years since Mr. Arthur Lowcock conceived the idea of casting the pipes for fuel economisers vertically, in dry sand moulds, with an improved core bar, instead of, as hitherto has been the custom, on a bank in green sand. Great credit is due to Mr. Lowcock for this improved system of pipe castings, and our inspection of those in the "Lowcock Economiser," exhibited

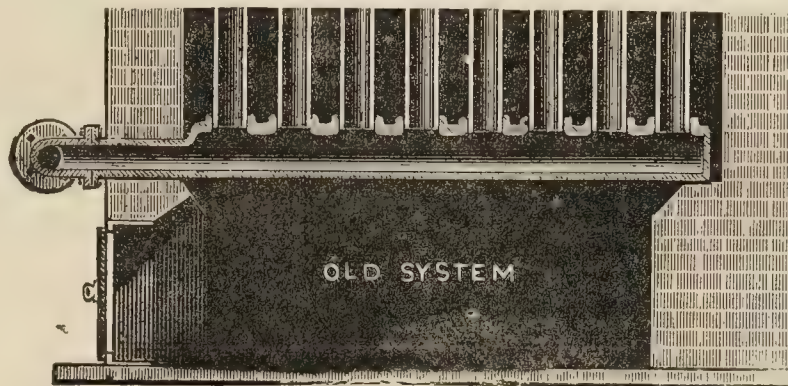


FIG. 3.

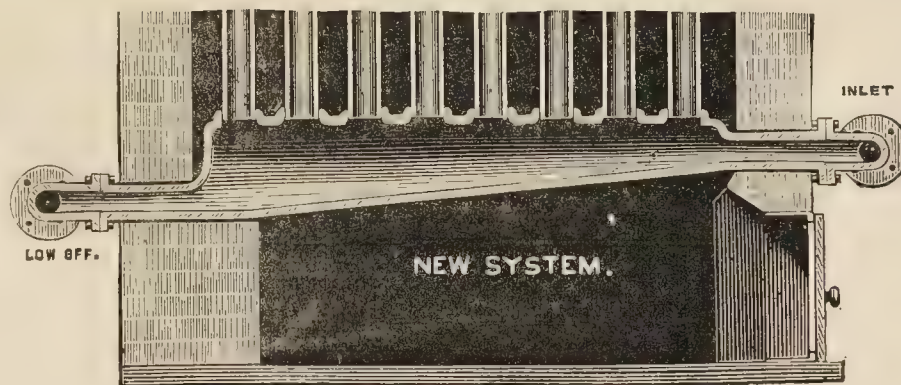


FIG. 4.

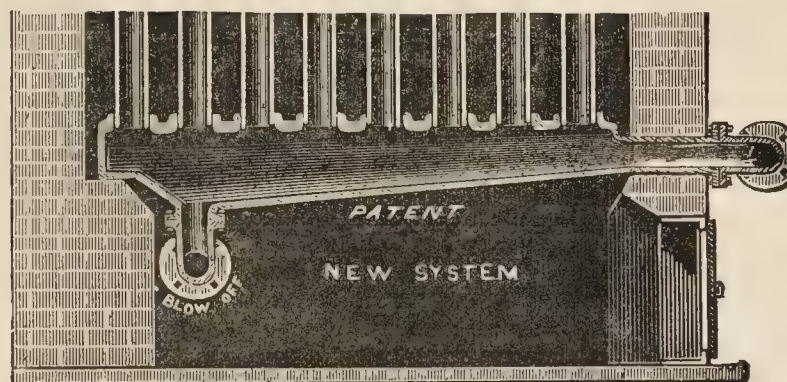


FIG. 5.

gives proof of this firm still holding their own as pipe moulders of the first order. As a sample of their work in this particular branch, they show, on their Stand, a single pipe, as taken out of the sand, before being dressed, or even the sand brushed off. If this be a fair sample of their work in pipe moulding, there is nothing further to be desired, and from inspection of the pipes, as fitted up in the sections of pipes on their Stand, they appear equally good castings, though the natural surface is hidden by a composition which has apparently been

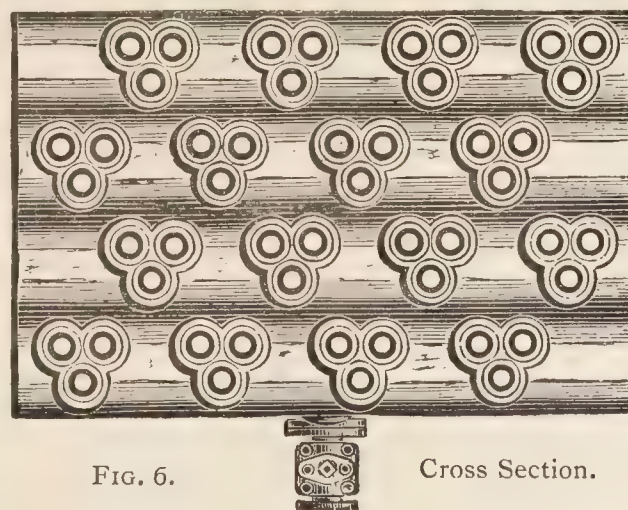


FIG. 6.

Cross Section.

applied to prevent their rusting during transit from the works to the Exhibition. The advantages derived from the pipes for economisers being cast vertically are obvious. 1. The pipe is insured clean and smooth, both outside and inside. 2. The metal is of even thickness throughout. 3. The casting is sound and free from air bubbles or dirt, consequently the pipe is stronger and more able to stand the highest pressures now put upon economisers. We now

proceed to deal with a most important point connected with the economiser, and one which seems to have been overlooked until the attention of users of economisers was drawn to the fact that it was possible for the pipes to become partially, and in many cases completely, choked up by mud and sediment, owing to the imperfect means and provision made for blowing off, and thus the apparatus rendered either useless, or the benefit to be derived from its application, seriously affected. To meet this difficulty, Messrs. Lowcock designed an improved bottom box, having the blow-off pipe at the opposite end of the section to the feed water inlet, and at a lower level, giving an incline towards such blow-off pipe, thus any

sediment which would be likely to form in the pipes, and bottom boxes, would be carried away by the blow-off pipe. Messrs. Lowcock exhibit an economiser of 160 pipes, divided into three blocks, each block being fitted with a different form of bottom box. The first block of 32 pipes, in four sections of eight pipes each, is fitted with the ordinary and old system of bottom box, as shown in Fig. 3, which, it will be seen, is perfectly straight, and the blow-off pipe serves as feed-pipe as well, and it is in this form of box that the mud and sediment have been found to accumulate and choke up the back pipes. The branch pipes on this block are provided with double branches for access to the sections, and allow the raking out of the mud

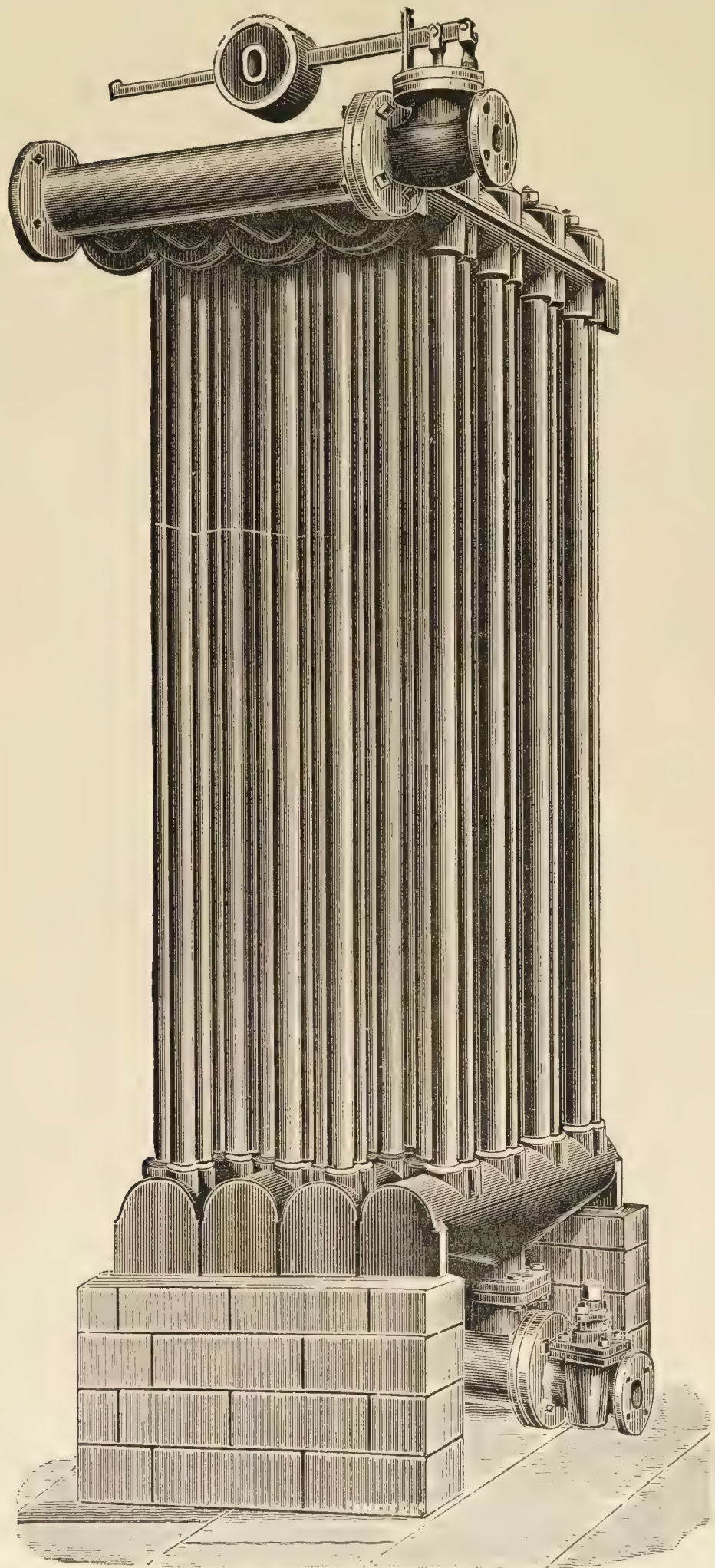


FIG. 7.

and sediment when required. The next block of 64 pipes, in eight sections of eight pipes each, is fitted with one of the several forms of new patent inclined bottom boxes introduced in the Lowcock economiser, as shown in Fig. 4. Here, it will be seen that the blow-off pipe is carried outside the soot chamber wall, at the opposite side to the feed pipe, with a steady incline from feed to blow-off. The other block of 64 pipes, also in eight sections of eight pipes each, is fitted with the new inclined bottom box, but with the blow-off pipe inside the soot chamber wall, as shown in Fig. 5. This latter is perhaps the most convenient mode, and is the most extensively adopted.

The effect of this improved form of bottom box will suggest itself to any practical man, and we endorse what was said by one of our contemporaries when the invention first came out. "That this is by far the most important improvement that has been applied to economisers for the last 30 years." Messrs. Lowcock have secured the invention by a patent, and are making all their economisers after this plan now. A special Single Boiler Economiser is also exhibited to meet the wants of small steam users. This, too, is fitted with the inclined bottom box, but, for convenience, the blow-off pipe serves as feed-pipe as well. The tubes of this economiser are made of a composition like locomotive tubes, and are called solid drawn brass seamless tubes. They are two inches in diameter, and six feet long, and are placed in triplets, and diagonally. A steam jet is substituted for scrapers, and this means has proved effectual in keeping the pipes clean and free from soot. This apparatus is illustrated in Figs. 6 and 7.

MR. JAMES HOWORTH, FARNWORTH, NEAR MANCHESTER.

In our June number, we gave a notice of the air propellers and humidifiers shown by this firm, and as the exhibit is extensive and varied, a further notice of some of its chief features will be interesting. These are as follow:—Patent Draughtless Inlet Ventilator (Fig. 1), with cast-iron baffle box, for admitting fresh air into factories, sheds, dwellings, schools, theatres, public buildings, &c., without perceptible draught. Patent Chimney-breast Outlet Ventilator, for ventilation of rooms by means of the smoke flue. This ventilator has been designed to supply a long-felt want, viz.:—that of ventilating almost all kinds of rooms by allowing the vitiated air to pass freely out, and preventing any down-draught or outside air from entering through the ventilator into the room. It does not project from the wall either when open or shut. The working parts are arranged so as to render it almost impossible to get

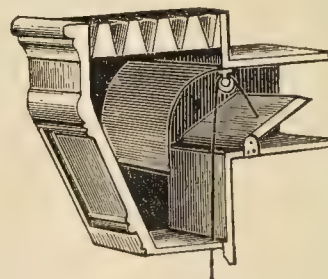


Fig. 1.

out of order. The bearings are provided with dust and smoke-proof covers so as to secure perfect working under all conditions, and the valve, being vertical, is not liable to accumulate soot or dust. It is guaranteed that twice as much air will pass through this as will pass through any other of the same size. It is very sensitive, this being due to the peculiar action of the plate. It is perfectly noiseless. These ventilators being placed in the wall of the chimney, the draught up the flue opens the valve, and draws the vitiated air rapidly

through, and should there be a sudden draught down the chimney, the valve immediately closes and prevents the smoke or soot entering the room, thus keeping the atmosphere pure. Mr. Howorth shows Dutry-Colson's patent fire-extincteur, for extinguishing fires in mills, workshops, dwellings, &c. Time is everything at the commencement of a fire. It is, therefore, important to have the remedy at hand. The "Extincteur" is that remedy. It is easy of application and always ready for use, requiring only to be protected from frost. No establishment should be without one. It is very simple, and is put in action by drawing up a knob at the top of the apparatus. It has no projecting parts. Each apparatus is tested by hydraulic power up to a pressure of 12 atmospheres, or 180lb. to the square inch. It only weighs a few pounds more than the liquid it contains. It enters into action immediately, and only at the moment of danger, and is not liable to get out of order by contact with the solution contained in it. One gallon of this solution is equal to 50 gallons of ordinary water for extermination of fire. It can be recharged in less than a minute. The charge is very cheap and of a known composition; this allows of its being emptied and cleaned from time to time (which, without being necessary, is always a safe precaution), and in this way a few persons get used to its working. Howorth's Patent No. 1 Archimedeian Screw Ventilators (Fig. 2), self acting, are also shown for ventilating weaving sheds, churches, chapels, schools, dwellings, bath and wash houses, stables, and public buildings, and also his New Patent No. 1 Radial Ventilators, self acting, for the same purposes as the archimedeian screw ventilators. These ventilators are of various sizes, suitable for public buildings, private residences, outhouses, and for every description of works, and for preventing down draughts and sulphureous smelling chimneys. Through the application of the archimedeian screw, perfect ventilation is secured without the possibility of down draughts. They are guaranteed to be in perfect working order for from eight to twelve years, without re-oiling or any attention whatever, if properly fixed. They are shipped to all parts of the world. The centres of these ventilators are of the most delicate character, and revolve on an imperishable substance; their durability and perfect means of lubrication have proved unequalled; thousands can be found which have required no attention for upwards of twelve years. They are also made with ornamental covers to suit any design of architecture, are used especially for churches, chapels, public buildings, mansions, &c.

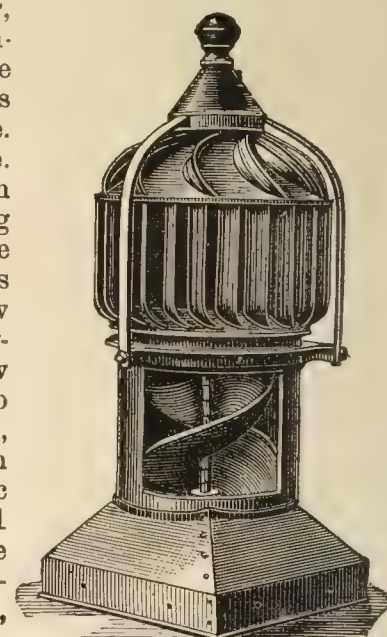
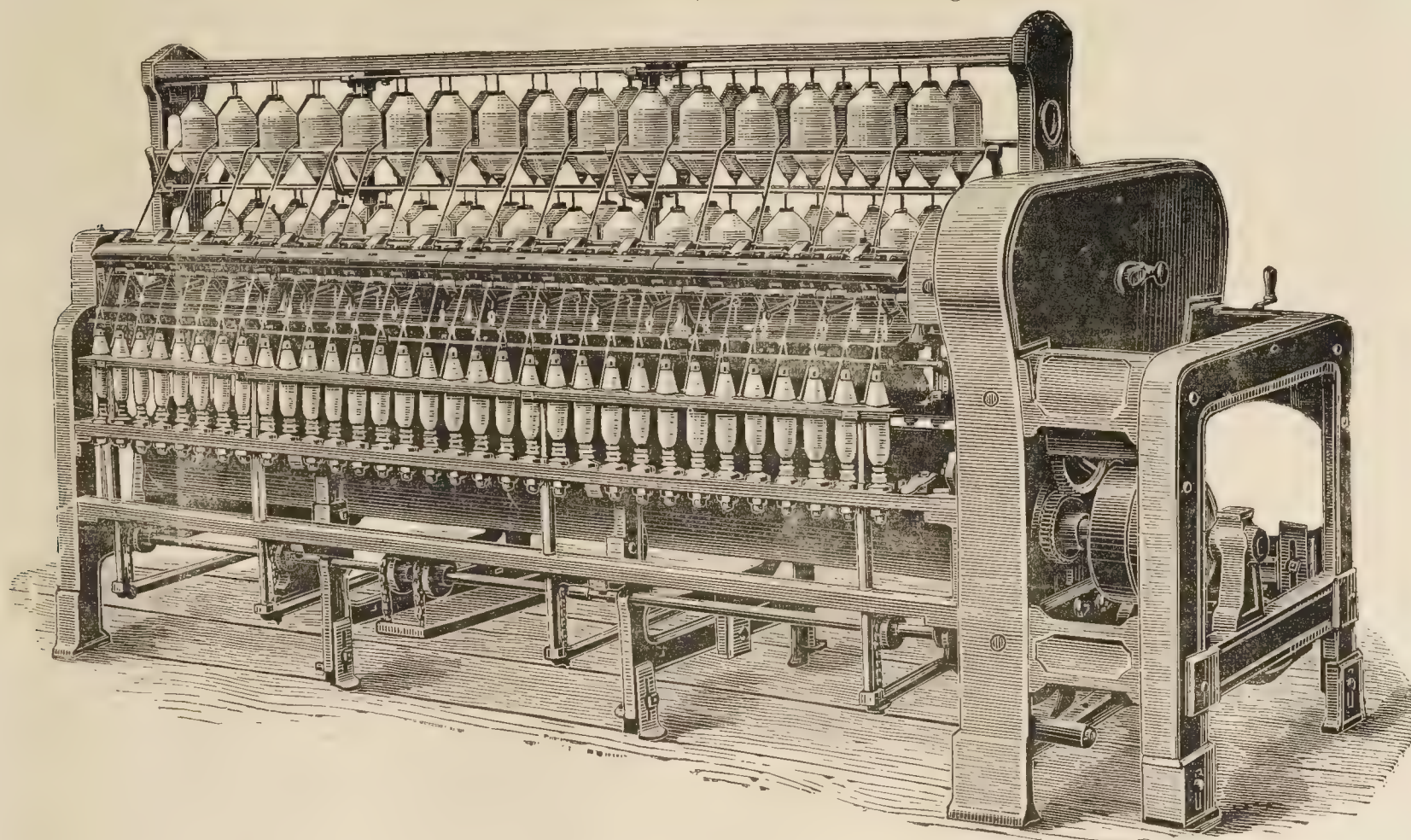


Fig. 2.

MR. SAMUEL BROOKS, MANCHESTER.

At Stand No. 443, this firm have an admirable exhibit of spinning, doubling, and winding frames. To Mr. Brooks is due the credit of the successful re-introduction of the "Ring system" of spinning and doubling, into this country, which system is considered by many to be the most advantageous method now in vogue, and, after many exhaustive experiments, and the production of the best possible tools for making the frames, the firm have succeeded to such a degree that the "Ring system" is now their chief speciality. As the ring doubling frame was the first to claim the attention of Mr. Brooks, so will we first draw the notice of our readers to this class of frame shown by the firm. There are two of these on view, one of which is for sewing cottons, and, as the two sides of this frame are arranged upon different systems, viz.:—the English and the Scotch—it is more highly interesting as showing the varying methods of accomplishing the same result. There are 58 spindles, $2\frac{3}{4}$ -inch gauge, 2-inch rings, and 4-inch lift, with patent "Ferguslie" and "Union" spindles for high speeds, and improved springs for holding the spindles in position. On the Scotch system, the rollers work in copper troughs so as to be partially immersed in water, with a lifting motion to raise the rollers when cleaning the troughs, whilst the English system shows the troughs behind the rollers, with a motion to lift the glass rods out of the troughs for cleaning. There are numerous improvements embodied in this machine, which will be best understood by an inspection. We now come to the second frame shown, this is for doubling two or three fold yarns; it is fitted with a patent automatic stop motion for each end, this stops both spindle and delivering roller simultaneously. There are 52 spindles, $3\frac{3}{8}$ -inch gauge, $2\frac{1}{4}$ -inch rings, $4\frac{1}{2}$ -inch lift; the spindles are on

revolutions per minute, spinning 20's counts, which would give a production of over three lbs. per spindle. The drawing frame shown for cotton, etc., has one head of three deliveries, with four lines of fluted rollers, 16-inch gauge. There are coiling, can turning, and patented front and back stop and knocking off motions for preventing roller laps—a most important feature—and patent can filling motion, causing the sliver in each can to be of uniform length; also a traverse motion and a weight relieving motion. We may add that these motions are positive and instantaneous in action. A machine which will claim the attention of manufacturers of cotton, woollen, worsted, silk, etc., goods, is Hill and Brown's patent winding frame, made solely by this firm. This frame has been, and is still being, largely adopted in this country and abroad for the above named goods, and has proved of the greatest value wherever introduced. It is for winding yarn on paper tubes or bobbins without heads, and the work is done in such an efficient manner that the yarn will not come off the edges. It has 12 drums, with a slot in each, through which the yarn passes when being wound. One side is fitted with a creel for winding two or more ends on one parallel spool, 5 inch traverse, with patent automatic stop motion to each end. The other side is arranged to wind one end on parallel or conical spools, 2 inch and 4 inch traverse. The creel is arranged to wind from cops, bobbins, or hanks. Any traverse of spool up to 6 inches can be made and built either conical or parallel. The machine is simplicity itself, not a single wheel entering into its construction. The patent automatic "Lemaire" feeder, made only by this firm, is on view. This apparatus is for feeding woollen and worsted cards. In a recent number of our Journal, we gave a full description of it, and therefore there is no need to enter into particulars here. The seven machines on view exhibit the high standard of excellence for which this firm is well



the self-contained "Rabbeth" system. The patent introduced into this machine has not previously been exhibited, and should prove of special interest to those doubling two or three fold yarns. There are two ring spinning frames shown, one spinning weft, and the other warp, yarn. The former has 68 spindles, $2\frac{1}{4}$ -inch gauge, $1\frac{1}{4}$ -inch rings, 5-inch lift; the spindles are of the self-contained "Union" type for high speeds, with improved springs for holding them in position. There are various patents embodied in this machine, amongst which may be specially mentioned the ingenious lifting motion for instantly turning up all the thread boards for doffing; the patent knocking-off motion for automatically stopping the frame when the pirns are full; and a patent thread guide which travels up and down, and effectually prevents ballooning; revolving clearers with patent adjustable fixings are shown on one side of this frame, whilst on the other side is a patent cone clearer, which travels from end to end of the frame. This latter, although but recently introduced, gives great satisfaction. The frame is spinning soft weft, the front roller running at 204 revolutions per minute. The ring frame shown for spinning warp yarns contains 60 spindles, $2\frac{3}{8}$ -inch gauge, $1\frac{1}{4}$ -inch rings, 5-inch lift spindles. These spindles are also of the self-contained "Union" type for high speeds. Amongst the improvements in this frame may be mentioned the patent finger bars and wires for holding down the wharves, with a motion to release all at one time when required for oiling or cleaning. The anti-ballooning apparatus on this frame consists of steel plates in which are circular holes, and a slit on the front edge to allow the yarn to enter. These plates can be set at a convenient distance above the plate containing the rings, and, as the anti-ballooning plates are lifted separately from the ring plates, ballooning can be effectually overcome at every part of the lift. By means of this apparatus, a lighter traveller can be used, a greater production obtained, and also a better yarn. The block gives a general view of the warp ring frame, but not of all the improvements introduced. The front roller is running at 210

known, whilst they show improvements at every point, clearly demonstrating that the makers are ever on the alert to render their specialities as perfect as possible, and so to keep abreast with the progressive times in which we live. Before concluding, we may draw attention to the American standard spinning and doubling travellers, in steel and composition, for use in the "ring" system, which are exhibited, and also to the show case containing samples of bobbins, various sizes of rings, patented and other spindles, and a variety of other articles for use in the above named machines, and also samples of single and double yarn, spools wound on Hill and Brown's winding frame, and cotton balls made on the "Ferguslie" balling machine. Those interested in spinning machinery should make an inspection of this case.

MR. SAMUEL SPENCER, WHITEFIELD, MANCHESTER.

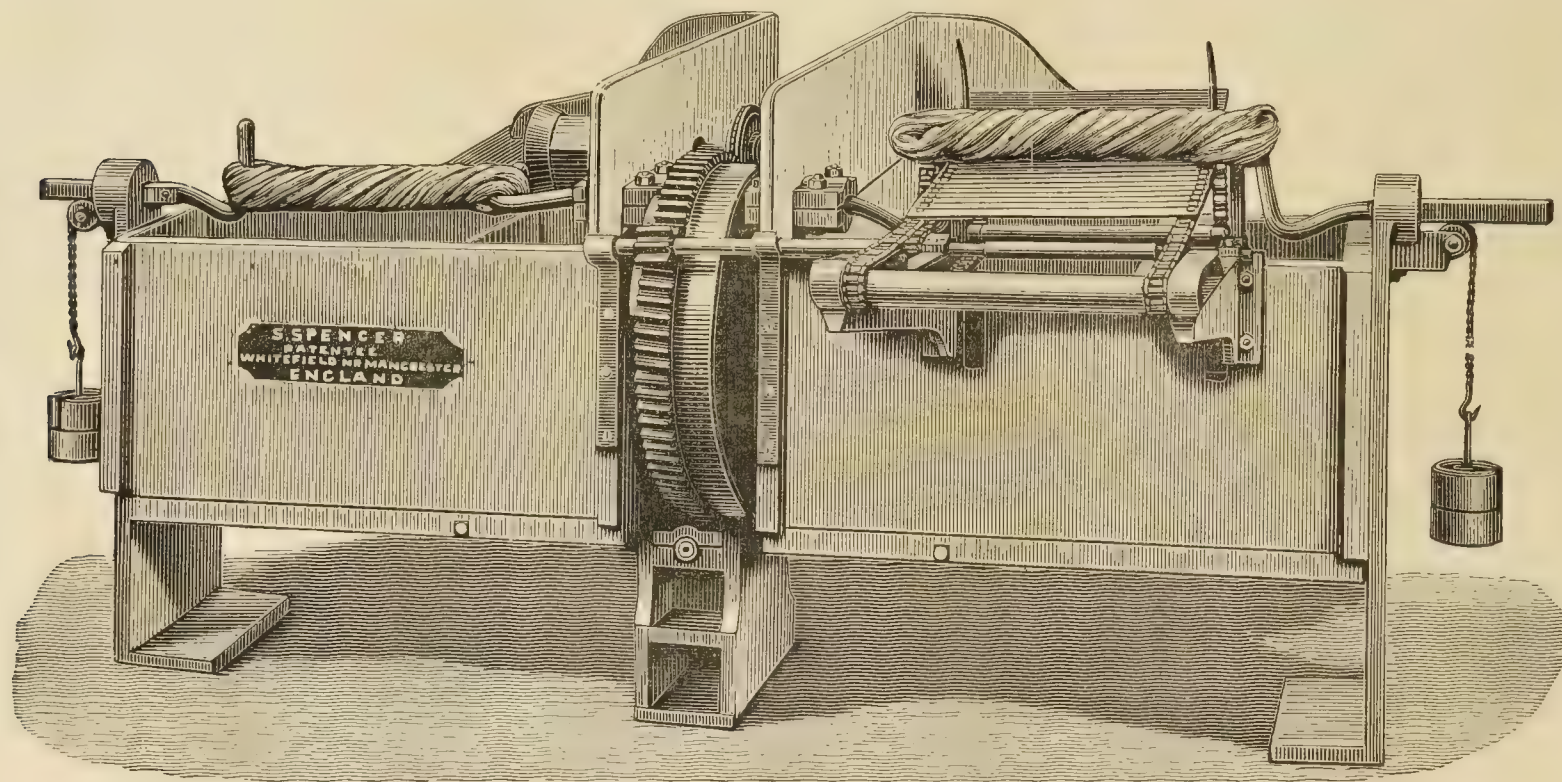
Mr. S. Spencer exhibits his patent hank sizing and wringing machine; this is adapted for sizing, scouring, mordanting, oiling, and wringing, cotton, linen, woollen, worsted, or any other kind of yarn. The great difficulty hitherto experienced by users of this class of mechanism in wringing equally any length, or size, of hank of yarn, is entirely overcome by the use of this improved apparatus. The machine illustrated is a double one: it can be worked at the same time both for running and finishing, or for running on both sides. When in operation, it takes much less power to run it than machines in general use, a considerable saving being effected in this respect. By an efficient arrangement of the wheels, the hooks, holding the hanks, operate in the size for the required time for sizing, and, at short intervals, they remain stationary long enough to enable the attendant to wipe off any superfluous size, and to change the hanks, by which time the hooks again commence working, and the operation is repeated. The machines are arranged to give different numbers of turns, according to requirements, stronger ones being made to give five, or any number of, turns for long linen, woollen, and other yarns. A very important feature of this machine is that

the drawing is adapted for, and can be readily fixed to, any number of blue vats, and the maker guarantees the mechanism to be more simple and powerful, as well as cheaper, and less liable to get out of order, than other machines for wringing purposes that have hitherto been used. The apparatus has already stood four years' test, and has been largely adopted by leading firms in the textile districts. It may be seen in operation at the Exhibition, in the machinery section, Stand 390, opposite the boilers, and it is well worthy the inspection of users of this class of machines. In addition to making the above, Mr. Spencer has a hank dyeing and wringing machine, and also an indigo dyeing and wringing machine, both of which are patented. The former is for cotton, linen, silk, jute, wool, and other fibrous yarns. It is a positive wring, and can be made to give any number of turns from one to seven, according to the length of yarn. In fancy dyeing, the machinery and hanks are not lifted, as in other machines, but, instead, the liquor is taken from the yarn, leaving the working parts in their proper

has no scale for the counts, neither is it necessary to carefully adjust the balance and get it into correct horizontal position before using. It is specially designed and constructed, and is equally applicable for indicating the counts of cotton, woollen, worsted, fleret silk, linen and jute goods, as well as for goods containing warps and wefts of different fibres, without necessitating any calculation or the slightest alteration in the balance, or any change in the weights. The only operation necessary for finding out the No. of yarns in such small bits of cloth is to cut the said cloth the size of the small templet made of sheet brass, which is supplied with each apparatus, and is the same for all counts. To find the respective Nos. of warp and weft, withdraw a certain number of threads of each from the piece in question, and place them (of course, separately) on the scale until it balances; the number of threads on the scale will then indicate the exact number of the yarn. By reference to

the annexed illustrations, the apparatus will be easily understood. The beam B B, made of thin steel wire, is bent at its fulcrum to an acute angle, and has its centre of motion in C, which point is slightly rounded. C oscillates on the sharp edge of a thin steel sheet A; the eye M in A is very small to prevent the beam from falling and to keep it always in its proper place, being inclined to rest on the lowest part, and thus allows the stand to have a little inclination. The direction of the beam B B is seen at a glance, and can be judged exactly according to the side arm E of the pendulum P, which is always retained in horizontal position by pendulum P and counterpoise E, and thus it is not necessary that the balance be placed in a perfectly horizontal position, but it may be

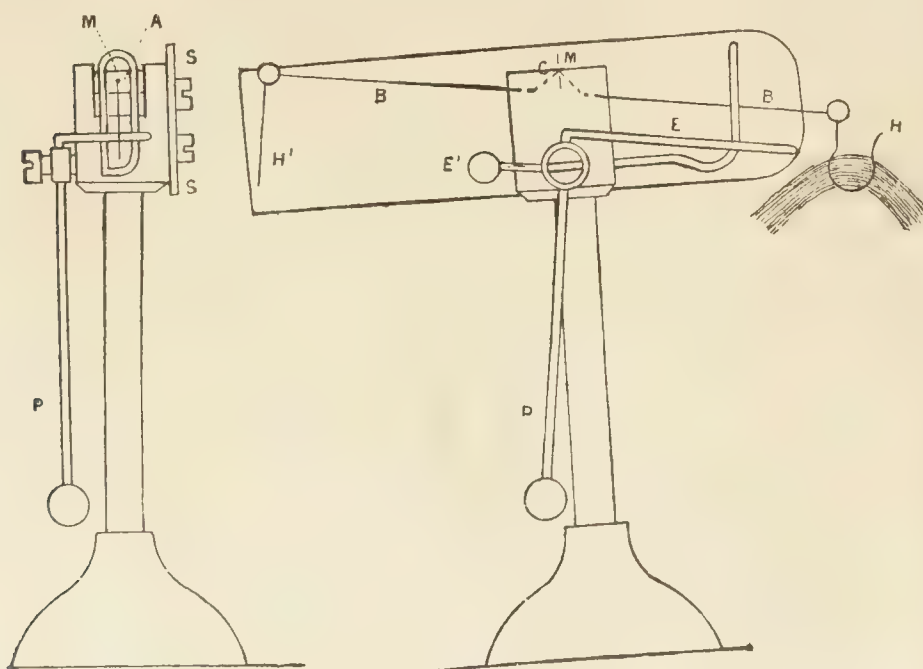
inclined either way. The background S of the balance is black to facilitate a correct observation. It is of paramount importance that such a balance should be constructed and adjusted with the greatest exactitude, and, in this respect, the apparatus is perfect; each balance is carefully examined and adjusted before leaving the works. This assorting balance is also invaluable to spinners of all textile fibres, inasmuch as yarn of odd lengths, or wound-off cops, &c., is as easily indicated by winding the same on the templet. Our readers would do well to become possessed of this appliance, which is supplied, with templets complete, at the low price of 30s. each.



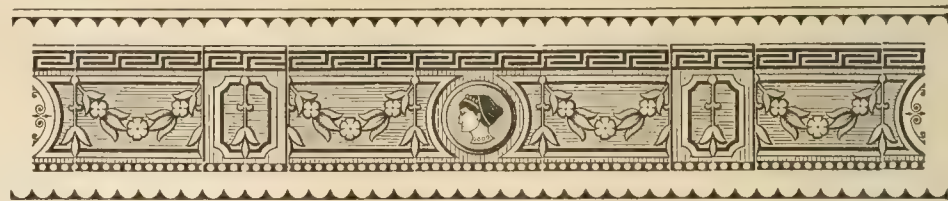
positions. It is entirely self-acting, the wringing mechanism not requiring any lever to be worked by the foot or tappet. The machine is admirably adapted for its purpose, and has already met with much favour. The indigo dyeing and wringing machine, for indigo vats, is applicable to any number, either double or single ranges. In the heavy woollen trade, it should prove of immense advantage in every respect. The wringing mechanism is placed in the centre, or at the end. If in the former position, the hooks can be driven from each side of the wheel. It is capable of wringing from four to eight hanks at one time. Neither tappets nor friction is required, as it is a positive wring. The whole of the machines are undoubtedly of the highest order with regard to the work they have to perform, and their use will effect a saving of from 30 to 40 per cent. on hand labour. Mr. Spencer will send the machines to any firm on approval, and they can be returned if they do not prove as good as they are guaranteed to be. This fact speaks volumes for their efficiency, far more than anything we can say in their favour.

MESSRS. GEORGE THOMAS AND CO., MANCHESTER.

In our last issue we gave a short notice of the exhibit of the above named firm. The space at our disposal prevented our mentioning Staub's Patent Universal Yarn Assorting Balance or Yarn Tester which they



show. The method of testing the counts of yarns in small bits of cloth presents unsurmountable difficulties. It is often desirable to find out the counts of warp and weft in a very small piece of calico or other cloth. This yarn tester is quite novel, reliable, and very simple. The apparatus



ORIGINAL DESIGNS.

On our first plate, we give a design for a Printed Handkerchief which has been specially drawn for us by a leading Lancashire designer. Whilst possessing peculiar suitability for the purpose mentioned, it is equally adaptable to a variety of other purposes, and we have no doubt will be useful to those of our readers producing fabrics of ornamental design.

* * * *

Our second plate shows a design for Printed Muslin for Curtains and other purposes. This is a neat and effective pattern and has been drawn by Mr. R. T. Lord, 97, Park Road, Bradford.

* * * *

Another pattern, by Mr. R. T. Lord, is given on our third plate, and is intended for Silk Damask for upholstery. This design may be used for other purposes, such as for a Tapestry Table Cover, Curtain centre, &c.



PRINTED HANDKERCHIEF.

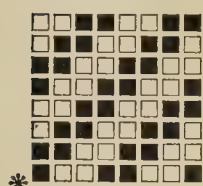




FASHIONABLE * DESIGNS.

Fancy Suitings.

No. 463.



* Design.

1,792 ends; 28 ends per inch; 28 picks per inch; 8 healds; 14's slay; 2 ends in a reed; 64 inches wide in the loom; 56 inches wide when finished.

Straight Draft.

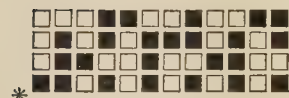
Weight 20 ozs.

Warped :—1 end Brown Olive 12 skeins
1 „ Brown Olive, 16 skeins twisted } Nine times.
to White, 40 skeins
1 „ Brown Olive 12 skeins } Once.
1 „ Black, Blue and Crimson twist
1 „ Brown Olive 12 skeins } Three times.
1 „ Brown and White twist
1 „ Brown Olive 12 skeins } Once.
1 „ Black, Blue and Crimson twist

Woven :—

2 picks Black 12 skeins } Five times.
2 „ Green 16 „ twisted to White 40 skeins
2 „ Black 12 „ } Once.
1 pick Green and White twist
1 „ Stained, Orange and Crimson twist
2 picks Black 12 skeins } Twice.
2 „ Green and White twist
2 „ Black.
1 pick Green and White twist } Once.
1 „ Stained, Orange and Crimson Twist

No. 464.



* Design.

5,544 ends in warp; 84 ends per inch; 76 picks per inch; 12 healds; 14's slay; 6 ends in a reed; 66 inches wide in the loom; 56 inches wide when finished.

Straight Draft.

Warped :—

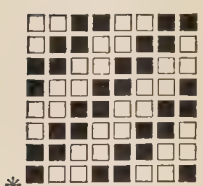
1 White worsted 2/48's, 1 White woollen 18 skeins }
1 Olive „ 1 Olive „ } Three times.
1 Olive „ 1 Olive „ }
1 Claret „ 1 Claret „ }
1 Olive „ 1 Olive „ }
1 Olive „ 1 Olive „ }
1 White „ 1 White „ }
1 Olive „ 1 Olive „ }
1 Olive „ 1 Olive „ } Once.
1 Claret „ 1 Claret „ }
1 Olive „ 1 Olive „ }
1 Bright Blue „ 1 Olive „ }

Woven :—1 pick White } Pegged to fall.
1 „ Olive } Eleven times.
1 „ Claret }
1 „ Olive }
1 „ White }
1 „ Olive } Once.
2 „ Bright Blue }

Weight 22 ozs.

No. 465.

Warped :—



* Design.

14 ends White & Orange twist, 2/28 skeins woollen.
1 end Claret twist, „ „
1 „ Black and Blue worsted, knob twist.

Woven :—

17 picks Dark Brown, 2/24 skeins woollen.
2 „ White and Olive twist, 2/28 skeins woollen.
1 pick Black and Crimson worsted, knob twist.

1,792 ends in warp; 28 picks per inch; 28 ends per inch; 14's slay; 2 ends in a reed; 8 healds; 64 inches wide in the loom; 56 inches wide when finished.

Straight Draft.

Weight 20 ozs.

New Stop Motion for Twisting and Winding Frames.

The firm of Mr. George H. Holden, sole licensee of Messrs. T. Unsworth and Co.'s patents, show at their rooms in Carr Street, Blackfriars Street, Manchester, some special machinery for cotton doublers, woollen and worsted manufacturers, and silk, hemp and jute spinners, and a visit from those interested will be well repaid. They have positive action stop motion winding and doubling machines, made for all sizes of bobbins, and in various strengths to suit all fibres, from silk to hemp and jute; in this class, they have a special light, low priced, machine for cotton. On the ring, flyer, and cap system, they show twisting machines with a new instantaneous stop motion to each spindle and roller; these machines are adapted for different kinds of fibres. They exhibit, also, twisting machines, with four rows of spindles, for all kinds of dry twisting; they are on a new system, and are made in various strengths to suit knitting

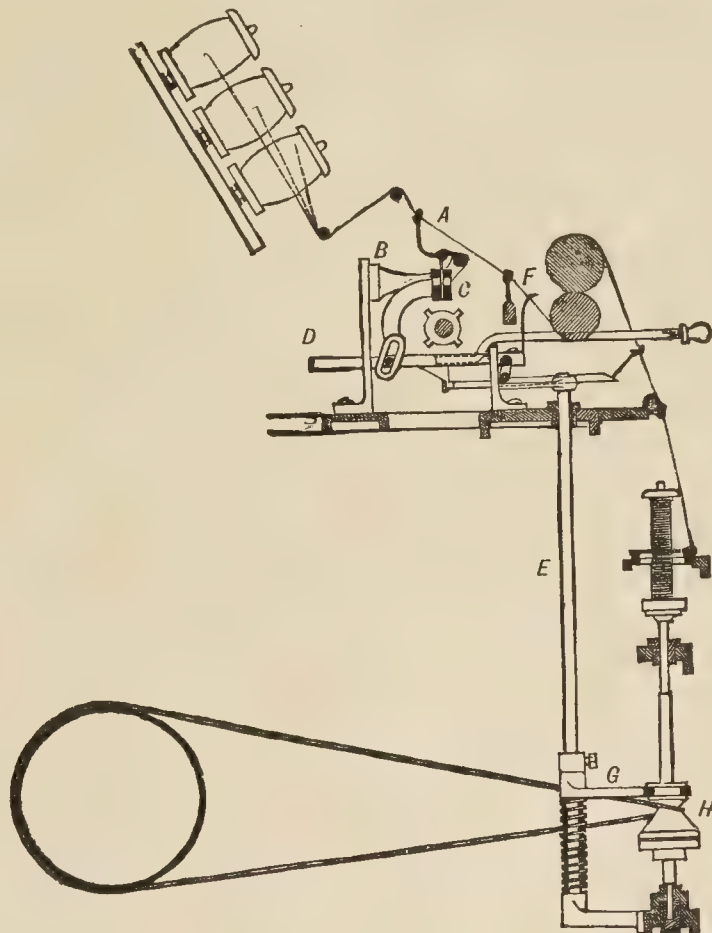


FIG. 1.

cottons, fingering worsteds, jute, hemp, and twines, &c. They have on view twine laying and spindle banding machines; for the latter they claim many advantages, amongst which may be mentioned that by it spinners may make their own banding from spoilt cops, &c., at a small cost. They exhibit "Murray's" patent twisting machine, which has met with much favour, being very effective in twisting cotton, and silk, worsted, woollen, and flax. A great speed and production, with strong and well twisted yarns, may be obtained by the adoption of this machine. It is working at 12,000 revolutions per minute on the threads, doubling with a flyer, and making a good twist. They have also various other mechanisms for hank winding, for loop banding and rope making, that deserve a word of commendation, but, perhaps, the stop motion twisting machine, mentioned above, will claim most attention. This firm claim many advantages for the apparatus, not the least being that existing twisting

machines of all kinds may be altered to this patent. In actual work, it reduces the making of waste to a minimum, and prevents roller-laps in doubling yarns. We give illustrations of sections of the apparatus. Fig. 1 shows the machine at work with spindle and roller running, and thread working, and Fig. 2 shows the thread broken, and roller and spindle stopped. It does not require a long explanation of the mechanism to convince our readers of the benefits to be derived by its use; the drawings given show the motion to be simple, and but little study is required to understand that the advantages claimed are in no wise overstated. The motion is considered the quickest in use, as, when broken, the thread cannot run more than 1½ inches. There is an equal tension on each thread; the spindle and roller are stopped instantly a thread breaks. There is a new metal clutch on the spindle, by which the great fault of slippage in the friction clips is

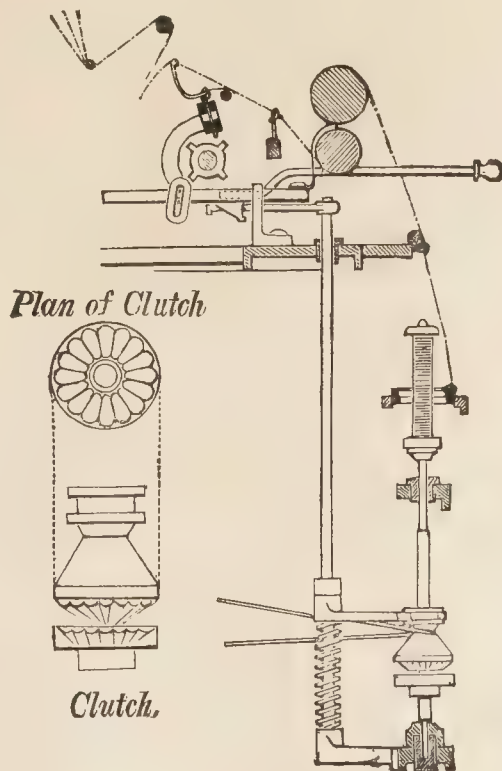


FIG. 2.

entirely obviated; the band continues to run on the loose part of the clutch when the spindle is stopped, so that the evil of a band being held and rubbing against a revolving cylinder, when stoppages occur, is prevented, and this absence of friction ensures a saving of spindle bands, and also of the tin drums. By reference to Fig. 1, it will be seen that the threads are drawn off the bobbins by a pair of rollers in the usual manner. They then run through bent detector wires A, which pass through the eyes of other wires, sliding in holes in a lever C, carried by the bracket B. This lever is formed with a slot in its lower end, and through this is fixed to a sliding bolt D, having an inclined plane on its under side, and a curved steel blade F upon its forward end. A vertical rod E is placed behind the spindle, a little to one side, having at its top a horizontal finger. A fork G is fixed upon the vertical end, and fits into a circular groove in the wharve H, which drives the spindle. This wharve, formed with a clutch underneath, is loose, a corresponding clutch being fixed upon the spindle. This will be more easily understood by reference to the plan shown in Fig. 2. When a thread breaks, the vertical rod E is raised, the horizontal finger moves up the inclined plane, this pushes the sliding bolt D forward, the steel plate F comes in contact with, and raises, the upper roller, and the drawing of the thread ceases. At the same time, the fork G, upon the vertical rod E, raises the wharve H, breaking the contact of the upper and lower clutches, and thus instantly stops the spindle. Machines with this motion may be on the flyer, ring, or cap system, with any sized bobbins, and cops; pins or bobbins may be twisted from. The machines on this system are made for worsted, woollen, cotton, silk, hemp, jute, flax, &c., and great speeds are obtained. The stop motion is as instant in its action when the spindle is running at 6,000 revolutions per minute as at 2,000 revolutions.

The Manchester Jubilee Exhibition.

(Continued from page 6.)

MAYALL'S AUTOMATIC SPRINKLER.

Amongst the many varieties of fire extinguishing appliances in use at the present day, none, perhaps, have claimed more attention from manufacturers than automatic sprinklers, and, therefore, we have pleasure in drawing attention to the exhibit of Mr. William Mayall, a member of the firm of Messrs. John Mayall, of Mossley, who has, after much careful study and experimental experience, perfected the automatic sprinkler figured in the illustrations below. The apparatus may be briefly described as a hollow brass ball, of peculiar shape, perforated with upwards of 60 holes, in various positions, the locality of each hole to accomplish the best result having been ascertained after exhaustive experiments. In the construction of the water joint, a valve is used, the spindle of which passes to the bottom of the apparatus, and is held in position by a lever (shown closed and opened in Figs. 1 and 2 respectively), hinged at one end, and having a fusible joint at the other. In case of fire, this joint is released at a temperature of 155 deg. Fah., and the sprinkler is set in motion. The water is projected upwards as well as downwards, and thus, in the case of any particular room being attacked by fire, the flames are prevented extending to a higher story, whilst the sprays, directed to the ceiling, return and assist in quenching the flames below. Each

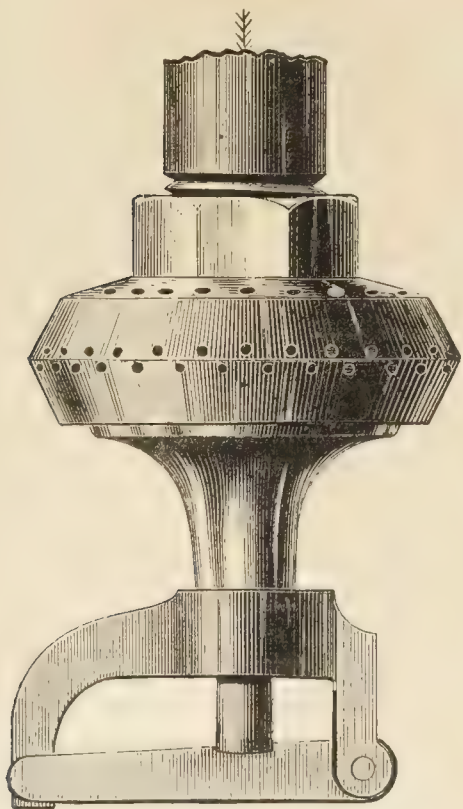


FIG. 1.

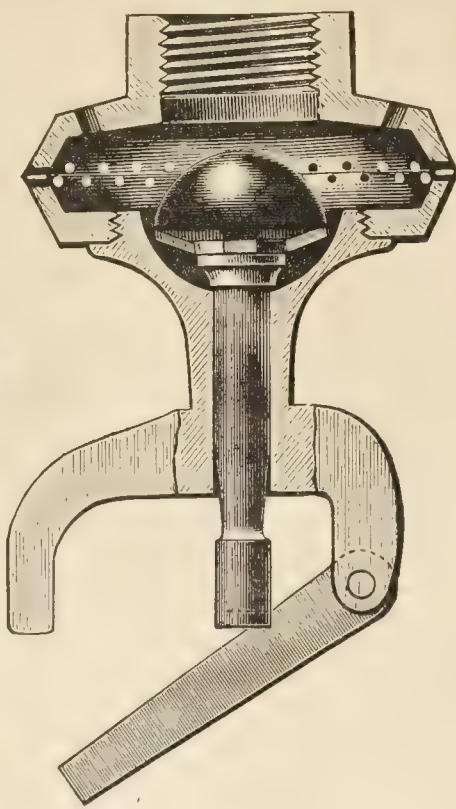


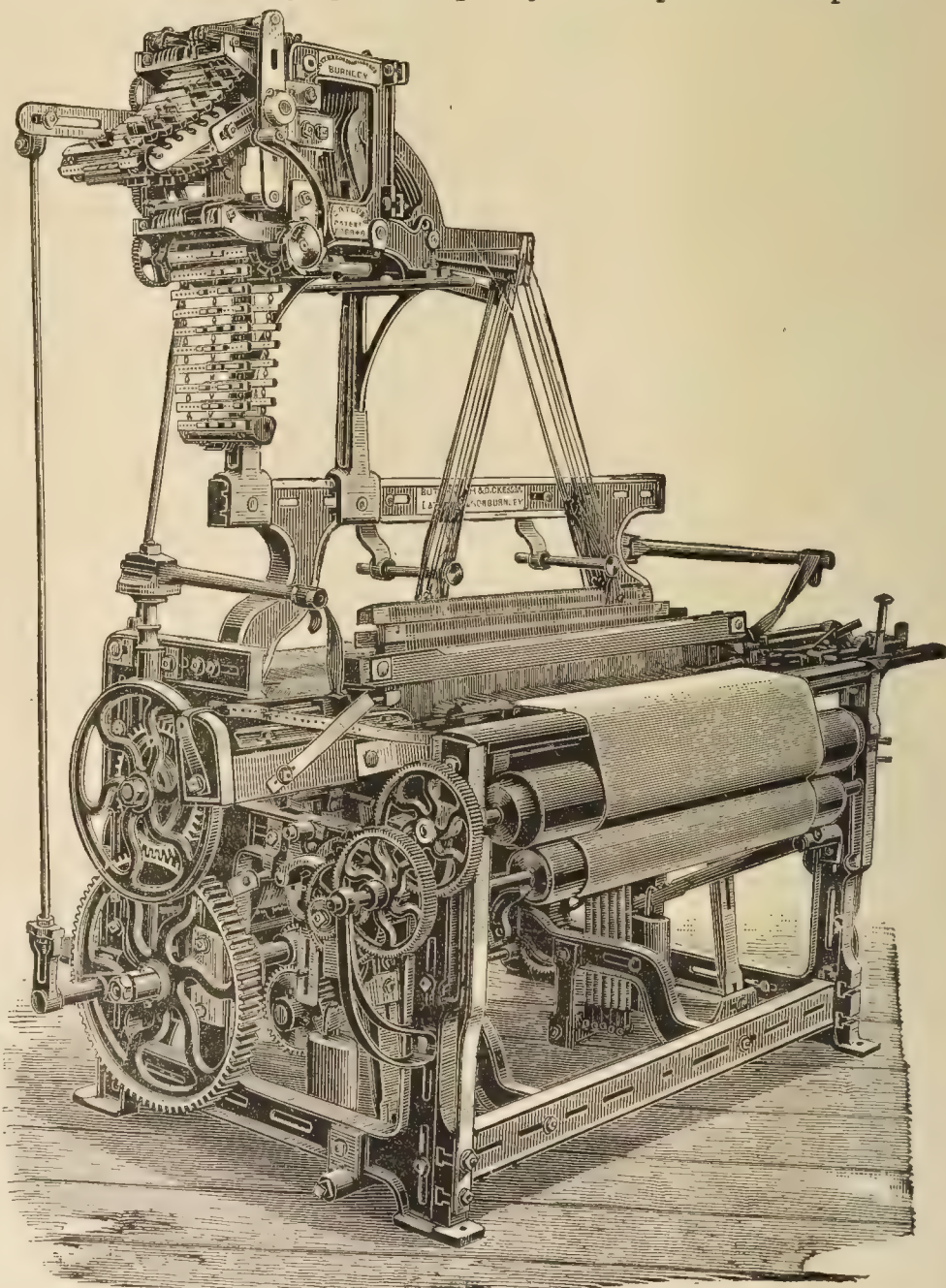
FIG. 2.

jet of water thrown out is converted into the finest possible spray, and falls with remarkable density and rapidity, whilst the area covered by a single sprinkler is no less than 30 feet in diameter. By the use of an apparatus constructed upon this principle, a fire may be extinguished without that copious use of water which is often as damaging as the flames it extinguishes. The inventor claims for his apparatus:—that, in consequence of the small quantity of water required to render it effective, a minimum amount of damage is done to machinery and goods; that the large area covered by each sprinkler, and the fineness of the spray, render its extinguishing power prompt and effective; that the water does

not come in contact with the solder either before, or during, the act of opening, and further that, the fusible joint being in direct contact with the fire, the apparatus is set in motion with remarkable promptness. There are no parts lost during the act of opening the sprinkler, which, being nickel plated, cannot corrode. Various tests have, from time to time, been made and witnessed by a number of gentlemen competent to judge on such matters, amongst whom may be named Colonel Sir Charles Firth, President of the Fire Brigade Association, and Superintendent Tozer, of the Manchester Fire Brigade, who have expressed themselves highly satisfied with the results of these tests. Messrs. Mayall are fitting their own factory with these sprinklers, showing that they thoroughly believe in the value of this invention, which example, other manufacturers would do well to follow.

MESSRS. BUTTERWORTH AND DICKENSON, BURNLEY.

Messrs. Butterworth and Dickenson, of the Globe Ironworks, are well represented in the machinery department. Their exhibit includes a patent loose reed loom, with patent dobby and weighting motion, a fast reed loom, a warping or beaming machine, a winding frame, and a cylinder sizing machine. Whilst the patent loose reed loom has all the lightness of the old loose reed loom, it is stronger and more durable; this renders it more suitable for weaving strong goods. It is arranged with a light reed case or swivel, suspended in brackets fixed on the slayswords, and when the shuttle is caught in the shed, and has to force out the reed, it presses nearer to the top, consequently the reed gets out with fewer breakages in the yarn. The arrangement is very simple and easy to keep in order, and the reed can quickly be replaced by the weaver. A great saving in the reeds and shuttles is effected by this invention. The advantages of the patent dobby attached to it are its simplicity and durability. Being made with two barrels, the lattice pegs are broader (7-16-inch gauge), consequently all fine points are dispensed



with, and neither needles nor heavy levers are required. It can be run at any speed—from 200 to 250 picks per minute. The vertical lever used in this dobby has an improved joint, which is much more economical than the old one, and the machine altogether can be kept in repair at one-half the usual cost of such machines. In the patent arrangement for weighting the warp beam applied to this loom only one weight is required, thus making it very easy for the youngest weaver to let-back. It is suitable for light or for heavy goods, can be easily regulated, and will aid materially in the production of perfect cloth. The fast reed loom, with five shafts outside, or Bradford treading motion, plain selvage motion, and patent letting back motion, is a well constructed loom, and adapted for weaving sateens and all kinds of Bradford goods requiring two, three, four, five, or six shaft treading motions. The patent letting-back motion applied to

this loom is very useful in the prevention of cracks or thin places so difficult to overcome in the weaving of light goods. The winding frame, for cop twist, with mangle wheel traverse motion, is a well made machine, fitted up with all the latest improvements. The warping or beaming machine is of the ordinary construction, with the addition of a patent stop motion, having the following advantages:—1, It is simple, and not liable to get out of order, and very little power is required to drive it; 2, it takes up very little space, and has fewer working parts than any other stop motion; 3, the pins are not liable to be plucked out of place and carried round the beam, neither will the machine work with ends down, as the pins remain in their places when the threads break; 4, no destruction of pins occurs, as the blow from the revolving roller is so light that the pins are never bent or broken, and can only want replacing when lost through the negligence of the warpers; 5, as all wheels are dispensed with for driving stop motion, the machine is steady and noiseless—two essential qualities in any machine. Next comes the warping or beaming machine (falling rod). The patent stop motion, mentioned above, is applied to this machine, and can be applied to all falling-rod machines, making them decidedly better than many of the self stopping machines which have, during the past few years, been so extensively used. The cylinder sizing machine has a patent friction, and patent yarn beam presser, the advantage of the latter being that the front rollers can be positively adjusted with the greatest accuracy up to the flanges, and they require no more attention till the yarn beam is full, even if the yarn is run on above the flanges, so that it is pressed from the bottom of the beam to the finish. The disadvantages of the paint being scraped from the flanges, the rollers getting sharp at the end and cutting the yarn, are also avoided. The patent friction is very durable, and can be accurately regulated without stopping or slackening the machine.

MR. DAVID MADELEY, MANCHESTER AND ROYTON. ELECTRIC VELVETS.

In our May number, we made reference to the patent electric plain and corded velvets, manufactured by Mr. David Madeley, of China Lane, Piccadilly, Manchester and Royton, near Oldham. On our Supplement Sheet, we give three actual specimens of these novel cloths, and invite the attention of our readers to them. For ladies' dresses, mantles, and other articles of wearing apparel, these cloths furnish a decided novelty. They are made in all the newest colours, and many varied and pleasing effects are produced when seen on the person of the wearer. Now the fabric resembles a snow covered mantle, now a star spangled sky, then cloth of gold, and again a rare and costly marble; in fact, there is no end to the variety of pleasing effects which can be produced in the patent electric velvet. As a contrast to these, corded electric velvets are made in more sober effects, and are not only useful for ladies' wear, but furnish admirable fabrics for gentlemen for shooting or riding suits, and for a variety of other purposes. These are made in all styles of cord, from the finest to the very coarsest. The process of imparting the mottled effect is patented, and is performed in such a manner that the marking is permanent, and will retain its effectiveness to the last. We have no doubt there will be a great demand for such charming and striking materials during the coming autumn and winter seasons. They are being exhibited in the machinery section at the Stand occupied by the Fustian cutting machine mentioned below, which is the first successful mechanism invented for this purpose. We understand it is used for cutting the cords manufactured by Mr. Madeley.

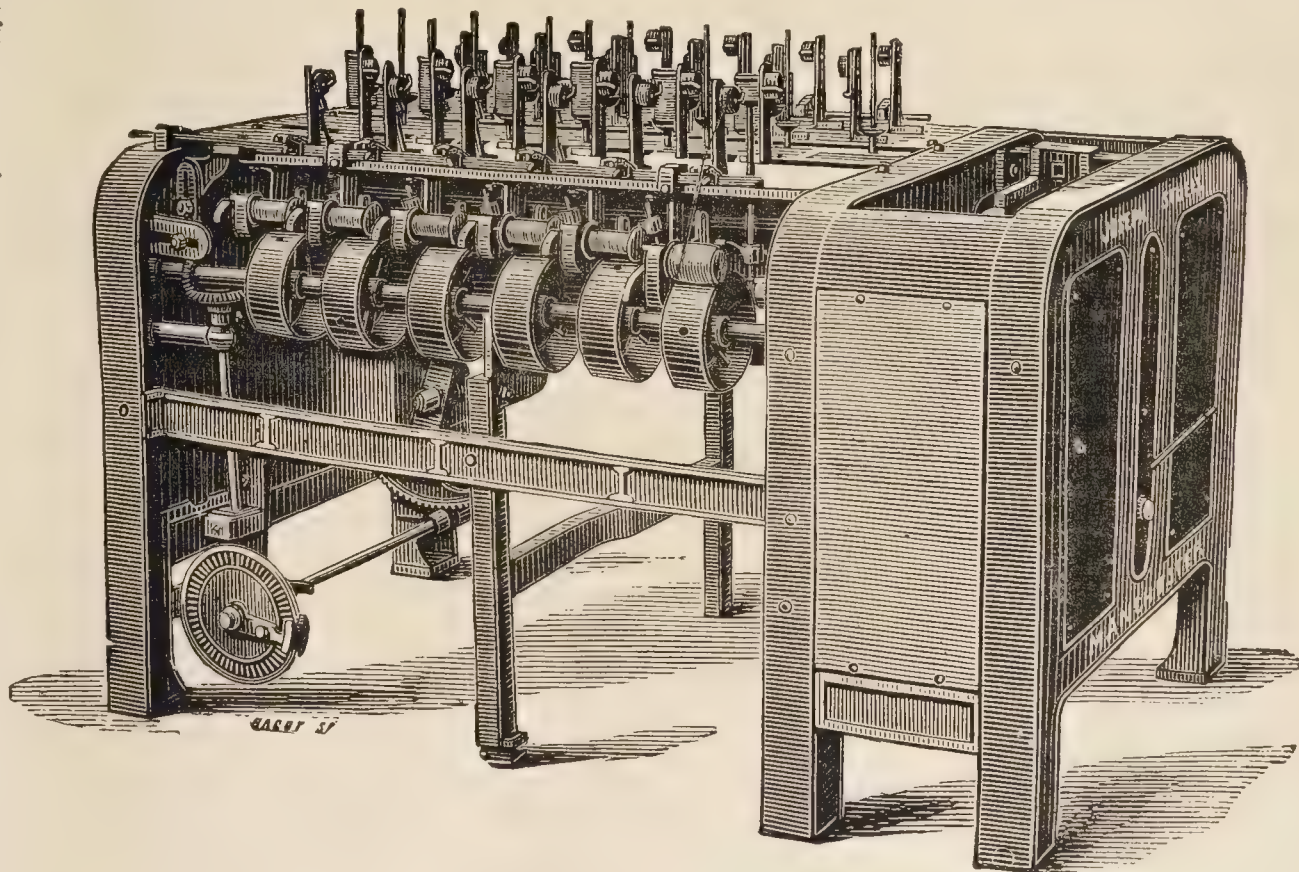
MR. DAVID MADELEY'S FUSTIAN CUTTING MACHINE.

At the Stand, No. 376, occupied by Mr. David Madeley, may be seen a new patent fustian cutting machine, invented by Mr. George Smith, of Hulme Works, Hulme Hall Road, Manchester. Hitherto fustians, and such like materials, have been cut by hand; this is a slow and tedious operation, each race of the fabric being cut separately by the aid of an instrument having at the end a fine-pointed blade. The new machine is arranged to act upon any number of races simultaneously, or, more clearly speaking, it cuts the full width of the cloth at one operation, and so quickly that ten pieces can be manipulated by its employment in the time required to cut one by hand, and it is claimed, further, that the cutting is more evenly, and generally better, done by the machine than by hand. There have been various difficulties to contend against in the production of a machine for this purpose, the chief of which has been the danger of cutting through the cloth. This has, however, been overcome by Mr. Smith, a description of whose machine will be of interest to many of our readers. The fustian is first wrapped upon an ordinary roller, from this it passes over two spiked rollers, these being weighted, more or less, according to the thickness of the cloth to be operated upon, in order that the latter may be as tightly stretched upon the former as is necessary for the success of the cutting. From these it passes over

two straight edges, leaving the latter of them at an angle of 45°, and close to which the circular cutters work. The cloth is then carried underneath the machine over another drag roller, and from thence it is wrapped upon another to be taken away. The cutters, or knives, are arranged upon a shaft, the position occupied by which is mentioned above, and make about 1,500 revolutions per minute. There is, of course, a separate cutter, as well as a separate needle, or guide, for each race of the fustian. The needles, or guides, are split in the centre to allow the cutters to run inside. This arrangement not only ensures the cutter being kept straight whilst working, but also prevents damage being done to the cloth by being cut through.

MR. JOSEPH STUBBS, ANCOATS, MANCHESTER.

This firm have an exhibit of winding, reeling, gassing, and other special machinery of a high order, which must claim the attention of all those interested in this class of mechanism or machinery who may visit the exhibition. We propose to briefly notice the chief features of these machines. The first in order is a Patent Quick Traverse Drum Winding Frame, which dispenses with the use of bobbins with heads, the yarn being wound upon paper, or wooden tubes, in such a manner that it cannot ravel off at the ends. To accomplish this, a quick traverse guide rail is adopted, by which spools of different sizes can be made on the same machine. Our space will not permit of our going thoroughly into the details of this machine at present, but we can confidently advise our readers to make an inspection of it at the exhibition. The next machine deserving mention is an improved Doubling Winding Frame, upon the drop wire system, to wind upon ordinary wooden bobbins. In constructing this machine, special attention has been paid to accomplish the best results in winding soft spun, or fine counts of yarn. The frame is fitted with a stop motion, so effective that, although it may be winding at the highest possible speed, upon a thread breaking, the bobbin stops, the broken end being found about 18 inches in front, which facilitates the satisfactory piecing of the yarn. The machine has only one row of drums, each drum serving two bobbins. This frame contains many improvements, and is constructed so as to occupy much less than the space usually required for this class of machine. The improved Cotton Gassing Frame illustrated below, merits special attention, and may be briefly described as follows:—The driving gear at the end is enclosed within a double framework, the gearing being arranged to allow the speed to be varied, so that the exact amount of gassing a yarn requires may be given. The guide rail is driven by bevel wheels from the bottom drum shaft, a mangle wheel motion being connected



with them, thus, different sizes of bobbins may be suited with the required lengths of traverse. There is a simple arrangement, to ensure the uniform and steady delivery of yarn, which prevents the injurious drag sometimes occurring in the use of an ordinary creel. The bowls for conducting the yarn through the gas flame are mounted in a novel manner, each bowl being provided with a small brass bush on which it revolves, the latter being carried on a stud of very small diameter fixed in the upright stand. The bush also has a slit in it lengthways, thus allowing the bowl to be easily withdrawn, when required, for purposes of cleaning, etc., and it is well and conveniently arranged for oiling and retaining the lubricant, of which only a small quantity is needed, and oil stains upon the yarn are rendered almost impossible. There is also a novel arrangement for the pulley bobbin and the gas burner. The bobbin, being mounted on a steel spindle, is fixed to a weight hanging from a bracket on the beam extending the length of the frame. A slotted hand lever is fixed upon the boss of this bracket, and also a shorter lever with two slots, into the second of which a finger of the gas bracket is inserted. By lifting the hand lever, the bobbin is removed from the drum, and the lever, being moved inwards, catches in a niche on the bracket, and is there retained, while the broken thread is being picked up, or any required work done. When this lever is lifted, the gas jet is withdrawn from under the thread, returning to its position again when the bobbin regains contact with the drum; this is accomplished in such a manner that

the thread cannot be burnt. By means of the hand, the jet can be prevented assuming its proper position for any length of time, but being released, will at once return to that position. Machines similar to this are made for the silk and woollen, as well as for the cotton, trades. Mr. Stubbs shows a Patent Bobbin Reel, which he makes either on the English or French system, to reel from doubler, throstle, or ring throstle bobbins, fitted with seven lea and crossing motions, also patent gate doffing motion, by means of which the hanks can be removed from the swift with very little trouble on the part of the attendant, and without having to lift it out of its bearings. This motion is also so arranged that it is almost impossible to oil, or soil, the yarn in doffing the hanks. The swifts are made with a new, and recently patented, "drop motion," the advantages of which are—firstly, its facility for closing the swift so as to get the hank to the doffing end, whether double or treble cross reeled, or coarse, wet heald yarns, the latter, as is well known, being always very tightly reeled on the swift; secondly, its lightness, and consequently high speed. For reeling ring-throstle bobbins, patent "snarl" or "kink" preventers are attached, which are extremely simple and effective. A Patent Cop Reel is shown, also made on the English or French system, to work by hand and power, and fitted with seven lea crossing and patent gate doffing motions, the latter acting in the same manner as in the bobbin reel. A Yarn Bundling Press is shown, made to work by hand and power, for 5 and 10lbs. bundles. This is well, and very strongly, made so as to be secure against breakage of any part. There is a special brake arranged to prevent any breakage of lifting wheels in case of accident. These Yarn Presses can be made to suit different sizes of bundles, according to order. Whitehead's Patent Automatic Stripper for carding engines will attract attention. Its chief feature consists of two bars, covered with flexible wire clothing, extending across the face of the cylinder. The upper of the two bars, or strippers, being worked by suitable eccentrics, is brought against the face of the cylinder, and thus combs or collects the strips exactly as is done by the stripper worked by hand, no dust nor short fibre, however, being thrown into the room to mingle with the atmosphere. An inspection of this apparatus will demonstrate its simplicity, efficiency and cleanliness, whilst its first cost, being low, is soon saved. The adjustable Yarn Clearers, for winding frames, shown are constructed so as to prevent imperfections in the yarn, such, for instance, as knots, soft piecings in the spinning, etc., passing to the winding bobbin, and are so arranged that four clearers or guides are all adjusted at the same time, the size of slits being fixed to suit the various counts of yarn required to be cleared. We are informed that they have been fitted to over 250,000 spindles. Balfe's Patent Piecing Machine is shown. This is a very simple apparatus for piecing yarns, into the composition of which several strands enter, and, when joined in the ordinary manner, form a most objectionable knot. By the aid of this machine, yarns may be joined by means of a simple twist, and it may be easily operated by any young girl. Our space will not enable us to further describe this machine, but we are informed that practical tests have been made, with the most satisfactory results. We may mention that Mr. Stubbs makes all descriptions of frames for winding from cops, bobbins or hanks, etc.; also gassing frames for cotton, worsted, and silk yarns; bobbin and cop reels; yarn bundling presses, and preparing and warping machines. He makes a good display at his Stand, No. 394, machinery section, to which our readers should pay a visit.

MESSRS. ROBERT BROADBENT AND SONS,
STALEYBRIDGE.

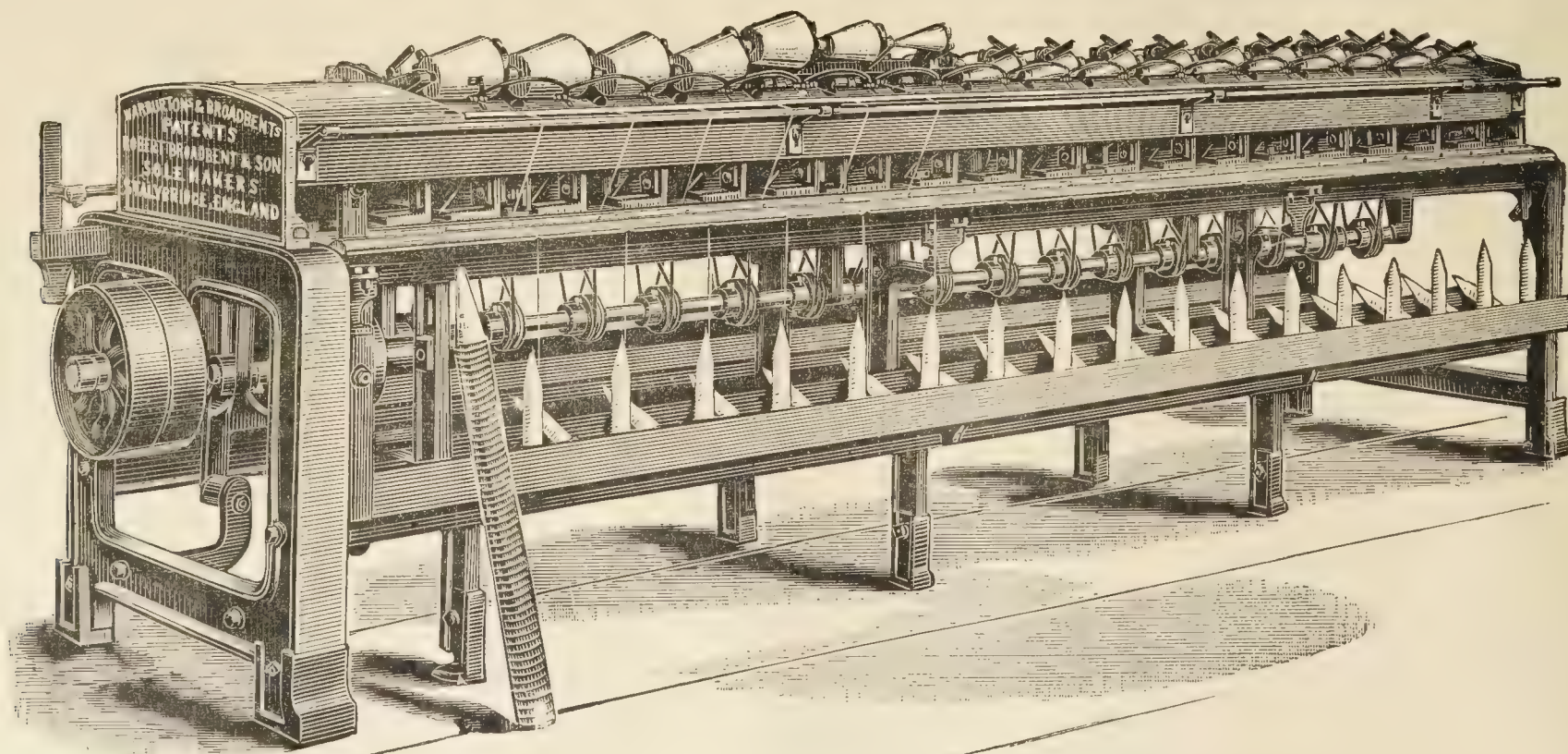
This firm have a good display of the class of machinery of which they make a speciality. Their patent drum winding frame, now being used by firms for whom it is adapted both at home and abroad, possesses a great many advantages in its mechanism; these deserve a word of

demonstrated in our columns on former occasions, we need not say more about their merit. In the winding process, the yarn is put upon the tubes so regularly and evenly, and in so compact a form that, in after use, it must run off with perfect freedom, thus reducing the making of waste to a minimum. The weight of yarn that can be wound on each one is greater than that by the processes in general use, and as the yarn is wound on in a taper form throughout, the whole of the thread leaves the tube without the least tendency to drag. The threads cross each other in layers at certain distances, and the disposition to adhere to each other, as in some processes of winding, is obviated, even after the yarn has been wound and kept in stock for some time. The yarns, after being wound upon the tubes, are firm, and, therefore, less liable to ravel when being packed. The tubes, when empty, fit into each other, so that economy in space and carriage is no small item to both spinner and manufacturer. From the illustration given, an idea of the mechanism may be gleaned. The parts are few, and the apparatus generally simple. The spindles, upon which the paper tubes are placed, work independently, and are horizontally arranged on both sides of the frame; they work in arms, which run up into catch brackets for piecing, and are driven by friction on drums of the same taper as the tubes; by this arrangement a perfectly conical bobbin is gained, a result not obtainable by any other machine. The yarn is placed on the tubes by guides having a quick traverse. When the spool is built up to the required diameter, it is removed, a fresh tube placed on the spindle, and the operation proceeds as before without stopping any but the spool requiring attention. The frame is fitted with the firm's patent carrier spring, this prevents any vibration that might occur from irregularities in the thickness of the paper tubes, or from an uneven state of the yarn being operated upon. An effective stop motion fitted to the mechanism, as well as a patent lever traverse motion, whereby a noiseless cam action is secured, and the speed of the traverse increased more than 20 per cent., aid in making this machine complete in every respect.

The Yorkshire Jubilee Exhibition at Saltaire.

THE WOODHOUSE & RAWSON ELECTRIC SUPPLY COMPANY,
BRADFORD.

The contract for the electric lighting of the Saltaire Exhibition has been given to the above-named Company. The dynamos, which are mentioned below, are nine in number. There are twelve arc circuits; they supply the lamps in the main entrance, various courts, concert hall, science and art schools, refreshment rooms, and the grounds. The incandescent circuits are four in number, the first of which supplies no fewer than three hundred lamps, the remaining three circuits also supplying a large number of lamps. The arc lamps are Statter's patent, manufactured specially for the Woodhouse and Rawson Company. All the arc lamps belong to different circuits, so that, should any become extinguished, sufficient light remains to work by. A further arrangement provides that, should a whole circuit be extinguished, no other circuit can be affected. This principle is adopted throughout the Exhibition for both arc and incandescent lamps. The incandescent lamps are of the Woodhouse and Rawson type. The cables are placed throughout the Exhibition in strict accordance with the most rigid fire insurance rules. This Company has arranged electrically to connect the engine supplied by Messrs. Hicks, Hargreaves and Co., Bolton, for working the machinery, so that, the instant



notice. In the first place, costly wood spools and bobbins are entirely dispensed with, and paper tubes employed in their places. The use of these tubes is now general in many branches of the textile trade, and the saving effected by their utilisation in place of bobbins having been

it is set in motion, a gong will be sounded to warn exhibitors who may be at their machinery. The engines for working the electric light have been supplied by Messrs. John Fowler and Co., Leeds. The whole of the dynamo power for the electric lighting, which extends throughout the

buildings and grounds, has been supplied by Messrs. Mather and Platt, of the Salford Iron Works, Manchester. The machines are all of their patent "Manchester" type, and have been specially manufactured by the above firm for the Exhibition. They are placed at the external end of the main building, a bay being partitioned off for the purpose by a low railing, allowing the engines and dynamos to be easily viewed from the building, or, still better, from a gallery, which has been erected above the belts driving the dynamos, so that the public can inspect the machines even when at work. In all, Messrs. Mather and Platt have supplied nine dynamos, which comprise series wound machines of high tension, for working arc lamps in series, compound wound machines for working the incandescent lamps, a shunt wound dynamo for charging accumulators, and a special series wound dynamo for working the large search light used in the lighthouse, erected on the top of the Institute Buildings. Two of the arc lighting machines will supply current for 45 lamps each, the lamps being of 2,000 nominal candle power. The lamps are arranged in five parallel circuits, of nine lamps each, the potential required being 500 volts. The two incandescent lighting machines will each work up to 350 lamps. The whole installation is a fine display of the Manchester dynamo, and shows to advantage the various purposes for which the machines can be employed.

Mr. THOMAS HENDERSON, LIVERPOOL.

There is no subject which merits a share of public attention more than that of the smoke nuisance. It is patent to every thinking person that, by the adoption of means calculated to lessen the pouring of dense volumes of smoke from the chimneys of manufactories of various kinds, the population of our large industrial centres would be greatly benefitted; the atmosphere would be clearer and fresher, streets and houses cleaner, vegetation richer, and these united would tend to the improved health of the inhabitants. Mr. Thomas Henderson, of Trueman Street, Liverpool, shows at his Stand, No. 259, Court No. 7, an apparatus for the lessening of the "Smoke Nuisance"—the "Simplex" Patent Mechanical Stoker. It is guaranteed that this stoker, with its adjuncts, gives the best possible arrangement for fulfilling the required conditions for the economical and perfect combustion of the solid and gaseous portions of the fuel, and, consequently, for the prevention of smoke. The general arrangement of the apparatus will be understood by reference to the illustration (in advertisement facing the last page of letter-press in this Journal). The coal, after passing through the hopper, is carried towards each furnace by a helical ram, driven by a ratchet and pawl, and deposited upon revolving shovels, by which it is distributed over the furnaces. The shovels are constantly revolving, and, therefore, all unnecessary springs, tappets, buffers, &c., are done away with. The arrangement of the machine is simplicity itself. A regular and even distribution of fuel upon the fires is secured, and the quantity required can be altered or regulated in the easiest possible manner by simply adjusting the throw of the pawls. The rams are separate from each other, and can be worked independently, so that the feed can be stopped from one fire, whilst the other can be kept in full work at pleasure; this is in itself a great advantage. Amongst the many advantages claimed for this apparatus, we may mention that, owing to the even and regular manner in which the fuel is distributed over the entire grate surface, a bright and effective flame is kept up all the time. This increases the generation of steam from a given boiler space to the extent of twenty per cent. as compared with hand-firing. It saves not less than ten per cent. in the cost of fuel, when the same quality is used as in the ordinary method of firing, while the manner in which the fuel is thrown on the fire causes ordinary slack to be as effective as good coal when fired by hand. It saves the injury to the boiler caused by the constant expansion and contraction of the plates resulting from the frequent opening of the fire-doors when fired in the ordinary way. It is not injured by the heat of the fire, all the working parts of the machine being external to the furnace. It is constructed and fitted to the boiler so as not to interfere with the usual method of firing—an advantage which steam users will fully appreciate. Its use secures a great reduction in the temperature of the stoke-hole. It effectually prevents the smoke nuisance. It requires very little power to drive it. It can be erected on any boiler in a short time, and can be kept in repair at a trifling cost. The fire-doors are so arranged as to admit the requisite amount of air on the most approved principle. The fire-bars are very durable, consequently, the cost of renewing them is small. These advantages, taken as a whole, are found to ensure a saving of from 15 to 30 per cent. in fuel, labour, space and time, and therefore in the amount of working capital employed. To meet the various requirements and wishes of steam users, Mr. Henderson will supply stokers with or without the moving bars, which can be applied at any time when the ordinary bars are worn out. Our readers would do well to pay a visit to the Stand occupied by this firm.

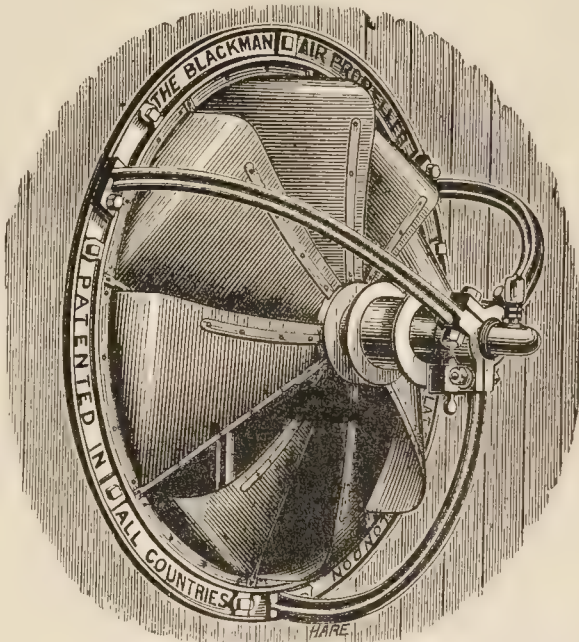
MESSRS. SHAW, HARRISON AND CO., BRADFORD.

One of the most interesting exhibits in the machinery section is that of Messrs. Shaw, Harrison and Co.'s patent "Sensim" screw gill preparing box, to which we briefly alluded in our May number, and which may be seen at work at their Stand, No. 221, Court V. The principle of an ordinary gill box is well known, and, therefore, a brief description of the machine under notice will show the difference, greatly to the advantage of the latter. The "Sensim" screw—for the cutting of which a patent has been taken out—is really "the feature" of the new box. The screw in the ordinary box with a regular pitch, which traverses the fallers at a uniform speed, is superseded by the "Sensim" screw which is of a continually increasing pitch, so that the speed of the fallers increases from their rise to their fall. Two sets of screws are used, the second set commencing their traverse at a speed slightly in excess of that at the finish of the first set, and the material is delivered by the rollers also at an increased speed. The result of this method of working is that the material operated upon, wool, mohair, or, whatever it may be, is gradually drawn out with the

fibre in one uniform direction, whilst the staple remains unbroken. The fluted rollers, which maintain a firm grip upon the fibre, are dispensed with, and plain rollers substituted, so that there is no powerful nip or forcible drawing of the material, this being effected in the easiest possible manner by the fallers themselves, and, being always free to give and take, the breakage of the staple is reduced to a minimum. There is thus a greater yield of top of better quality, as the average length is greater. The patentees claim further advantages for their machine over the ordinary preparing gill boxes. They affirm that a pair of the patent boxes will replace four ordinary boxes, at the same time turning out as much work, whilst the attendance required is only half that needed for the four boxes. There is less liability to get out of repair, whilst they are so constructed that every part is easily got at. The expense for the renewal of leather aprons is greatly reduced, as they are not cut or chopped and will, therefore, last much longer. The saving in power is an important item, a "Sensim" box running with two-thirds that required for an ordinary box. Space will not permit our going into further details, but we can confidently advise our readers, who visit this Exhibition, to see the machines at work, and thus judge of their capabilities for themselves.

THE BLACKMAN AIR PROPELLER VENTILATING COMPANY, LONDON.

This firm show, at Stand No. 185, Saltire Exhibition, the following specialties for ventilating, cooling, and drying:—A 48-inch Blackman attached to a small section of a drying table, suitable for wool, rags, hair, &c. This size will dry up to 8,000 lbs. of wool per day, and is also largely used to dry yarns, cloth, &c., in tentering machines and stoves, by means of a large volume of cool air drawn through the material. A 36-inch Blackman is shown above the 48-inch, running at 600 revolutions, and moving 15,000 cubic feet of air per minute, by the expenditure of 1 I.H.P.; attached to this is a pair of automatic self-closing shutters, which close when the propeller stops, and so prevent entrance of rain, &c. A 24-inch Blackman is fixed above the 36-inch, and is run simply to ventilate the court in which it is placed. Each of these propellers is fixed to a light wooden frame by three special light brackets; these facilitate the application of the fans considerably. There is also shown a water driven propeller, which consists of a small Blackman, driven by a fine jet of water from the ordinary supply, and designed for use where other power is not available; this appliance will work with any pressure of water above 5 lbs., and will move up to 50,000 cubic feet of air per hour. Blackman air propellers are also used in various parts of the Exhibition for ventilating and cooling purposes, in the steam bakery, the kitchen and meat stores, and to remove steam from woolwashing machinery. At the Manchester Exhibition, this firm have an exhibit very similar to the above, with the addition of a 36-inch propeller attached to a glass duct to show the method of removing dust by tubes. They have propellers at the Newcastle Exhibition also.



The American Dry Goods Market.

LADIES' DRESS GOODS.

In ladies' dress goods, the orders already booked for fall, are not equal to those of last year at this time, but the prevailing impression is that later goods will be wanted in a hurry, on account of the stock in jobber's hands being small. There have been, for the last three months, upwards of 25 per cent. of the mills, on dress goods and flannels, either entirely closed or working only four days per week, and the majority of those at work, have been making to stock. Wool has gone up $7\frac{1}{2}$ per cent. on last season's rates, and goods have fallen $2\frac{1}{2}$ per cent. in the same time. With this restricted production of the mills, there will be but little stock of desirable goods to draw from. The present prices are not such as could be wished, when taking into consideration the aspect of the wool market, but this is not the first time, nor will it be the last, when the price of the manufactured product bears no desirable ratio to that of the raw material. The predominating shades in piece dyes for fall wear are dark greens and olives; browns, from tan to seal, and blues of every shade; in mixtures, blue and white, brown and white, black and white, with a few illuminated mixtures for combination garments; small checks, and over plaids, with very bright colours, will also be largely used for children's wear. The demand for worsteds has been chiefly confined to small duplicate orders, plain fabrics having received the most attention, though certain desirable makes in fancies are called for, and are being well

looked after. In cassimeres, (woollens), the movement is still mainly on the lower grades, and on union cassimeres, the finer grades showing little or no animation; this class of goods is in a deplorable condition, and many auction sales are at the present time taking place. Cheviots retain their relatively superior position, and are in good demand, especially in low and medium qualities. Rough finished goods in small checks and plaids, and navy blues, are predominating over all cloth finished goods. The trade in shawls is very quiet, and is confined to certain styles which have a tendency to be bright, with fancy effects. Jersey cloths are selling well, and are in good demand, and owing to the advance of worsted yarns, prices are firmly held; the stockinette trade is in a flourishing state. The condition of the wool market is stiff, and manufacturers are restricting their purchases within the limits of their actual requirements, and propose to continue in this course for an indefinite period, hoping that, when wools have accumulated in the hands of dealers or speculators, the anxiety to sell will enable them to obtain supplies at a more moderate figure.

Electric versus Gas Lighting for Mills.

Continued from February Number.

In our last article, we dealt chiefly with the relative cost of lighting by gas and by electricity. The subject may, however, be regarded from other stand-points, standpoints which we venture to think will, upon consideration, be judged to be equally important. These are increased production, better quality of production, and improved sanitation. These three very important factors in making a concern pay are secured by obtaining more light, whilst at the same time there is no increase in the temperature of the room lighted. Some time since, we indicated the great influence that atmospheric changes have upon the successful manipulation of textile fabrics, or upon the yarns of which they are composed, and we spoke of the importance of keeping the rooms in which the processes are carried on at as neary as possible one temperature and one ascertained degree of humidity. This is, at all times, in every part of the world, a most difficult thing to secure, but the use of gas makes it far more difficult. It is no unusual thing to find the temperature of a room to increase ten degrees of heat after the gas has been lighted for some time, and the supply of moisture taken from the air when thus heated must be obtained largely from the materials in process. The great heat from the gas also affects the life of the strapping used in the room, whilst the sulphur and smoke discolour the ceilings and damage the paint. As clean ceilings are no unimportant factor in the lightness of a room, dark ceilings absorbing the light, it is evident that gas must cost an appreciable sum every winter, especially in low rooms, from this cause alone. The displacement of gas by electrical lights is distinctly felt by the operatives as a benefit. In one large concern lately, owing to the electrical plant being out of order, the old gas supply had to be resorted to, with the result that the weavers all left their work. A better proof of the advantage of the new system could hardly be obtained. From a sanitary point of view, the electric light commands the attention of all those who consider these matters. Not only do the operatives work in a cooler and more equable temperature, but the air they breathe is purer, and, consequently, their last hour or two of work is attended to better than is usually the case. Their vital force being less exhausted, they are able to give more and closer attention to their work, and, in going out into the cold outside air, are less liable to take cold. It is surely needless to point out that the less illness there is amongst the operatives in a mill, and the more regular will be the production of that mill.

PATENTS.

Applications for Letters Patent.

Automatic improvements in shuttle guards for looms. T. Calvert, Preston.	27th May	7,687
Attachments for looms. J. Tschörner and K. Wein, London.	27th June	9,123
Brake mechanism for looms. R. Whalley and W. Wells, Blackburn.	3rd June	8,000
Built up or combination fabrics suitable for carpets. W. P. Thompson, Liverpool.	4th June	8,058
Belt fasteners. W. H. Gilruth, Manchester.	9th June	8,279
Cutting or shearing textile fabrics. E. Law, Liverpool.	1st June	7,933
Connecting ends of driving belts. W. H. Gilruth, Manchester.	9th June	8,278
Connecting pickers with the picking sticks of looms, and communicating motion to the pickers. H. and L. and F. C. Lister and G. Thewlis, Bradford.	11th June	8,417
Carpets, &c. H. Fawcett, London.	17th June	8,772
Determining the percentage of clean wool in any quantity of raw wool. E. Jaegermeyer, London.	3rd June	8,045

Driving belts and bands. R. Dick, Glasgow.	25th June	9,043
Figured fabrics. C. Brazil and J. E. Johnson-Ferguson, Manchester.	27th May	7,689
Figured fabrics. C. Brazil and J. E. Johnson-Ferguson, Manchester.	27th May	7,690
Figured cloths for mantles, dresses, or upholstery. T. R. Ashenhurst, Bradford.	3rd June	7,997
Formation and actuating of shedding tappets for stave or shaft work in looms. J. Knowles and J. Mercer, Blackburn.	11th June	8,419
Feeding wool, &c., to carding machines, and apparatus for cleaning, dressing and removing burrs, &c. E. Wilkinson, Huddersfield.	17th June	8,725
Feeding and drafting rollers. D. B. Briggs and W. Eastwood, Bradford.	18th June	8,777
Gig mills for finishing. E. Michaelis, A. Smethurst, and C. Wood, Manchester.	31st May	7,844
Imitation lace or tulle machines. E. Davenière, London.	7th June	8,205
Jacquard machines. J. McMurdo, Manchester.	13th June	8,460
Looms for cut pile fabrics. J. Y. Johnson, London.	27th May	7,734
Looms. C. Hahlo, E. Liebrech and T. Hanson, Halifax.	1st June	7,917
Looms. J. Ingham and W. Simpson, London.	6th June	8,099
Letting off the warp in looms. B. C. Sykes and G. Blamires, Halifax.	8th June	8,223
Leno weaving. W. J. Riley, Manchester.	25th June	9,029
Machinery for making organzine or silk warp in which the single threads are twisted, doubled and re-twisted by a continuous operation. J. E. Tynan, London.	14th June	8,535
Pressing cloth, &c. J. Longtain, Leeds.	27th May	7,712
Picker preservers for looms. J. W. Howard, Halifax.	1st June	7,918
Pulleys. H. E. Ludwig, London.	3rd June	8,042
Pickers (loom), straps and buffers. J. and E. Horrocks, Bradford.	7th June	8,161
Pickers. S. and Y. J. Fielden, Manchester.	13th June	8,478
Picking sticks. E. Hollingworth, Halifax.	15th June	8,592
Picking mechanism of looms. I. Sowden, Bradford.	22nd June	8,882
Preventing snarling and equalising tension whilst reeling. J. and W. Schofield, Oldham.	27th June	9,090
Rheaa or other like fibre from rheaa or China grass. G. I. J. Wells and S. L. Howard, Liverpool.	1st June	7,932
Removing dirt or noil from cards of carding engines. C. and F. de Hemptinne, London.	11th June	8,422
Raising and lowering healds and shuttle boxes. C. Bedford, Halifax.	17th June	8,726
Regulating and indicating the production of "doffings" in spinning. J. M. Tankard and H. W. Broadbent, London.	22nd June	8,885
Ribbon. A. Blackburn, London.	23rd June	8,956
Smoke consuming. T. Taylor, London.	28th May	7,815
Shuttle pickers for looms. A. J. Fabre, Liverpool.	6th June	8,128
Scouring wool and apparatus. E. Tremsall and A. Dicktus, London.	7th June	8,178
Stop motion for twisting and doubling yarns. E. and D. Sykes Huddersfield.	10th June	8,325
Starting and stopping machinery. J. Ellison, Halifax.	10th June	8,326
Shuttle pegs or spindles. J. Atkinson and D. Hirst, Leeds.	14th June	8,513
Sizing warps. R. Gledhill, Bradford.	24th June	8,974
Tension devices for shuttles. J. Ireland, Dundee.	28th May	7,796
Treatment of vegetable fibres for spinning, &c. W. B. Nation and J. J. Worswick, London.	3rd June	8,041
Treading motions of looms. R. Hall, Manchester.	14th June	8,511
Twist lace machines. B. Hallatt, London.	17th June	8,751
Weaving. S. C. Hooper, Rodborough and Marling and Co., Stroud.	31st May	7,877
Weaving long pile fabrics and apparatus. J. Taylor, Manchester.	4th June	8,062
Weaving and manufacturing pile fabrics. O. Drey, Manchester.	6th June	8,102
Warp beams. J. Goff, London.	11th June	8,428
Winding yarns or threads. W. T. Stubbs, Manchester.	15th June	8,601
Washing wool, &c. W. Ambler and W. Owen, Blackburn.	17th June	8,721
Weaver's shuttles and operating the same. E. F. Schmirk, London.	24th June	9,014
Yarns. T. H. Blamires, Huddersfield.	10th June	8,330
Yarn and cloth finish. N. O. McIlhagga, Belfast.	18th June	8,775

Patents Sealed.

3,975	6,193	6,828	7,102	7,943	10,004	12,723	2,123
2,583	2,764	4,891	5,621	5,643	6,927	6,940	6,975
7,044	10,746	697	6,389	7,227	7,236	7,315	7,434
16,043	16,765	2,213	7,244	7,098	7,398	7,534	7,550
7,608	11,208	14,251	106	3,196	3,208	3,257	5,571
7,642	8,065	8,194	3,534	5,353	6,317	7,791	7,212
8,185	8,706	9,761	718	1,090	2,866	3,623	3,897
5,598	7,517	8,122	9,357	10,920	16,571	3,925	3,898
3,999							

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The Jubilee Exhibitions.

MESSRS. MATHER AND PLATT, SALFORD.

ELECTRIC LIGHTING.

In our issue of July 12th, we described at considerable length the interesting exhibit of this firm, showing the application of electricity to the distribution of power, and we described, in detail, a large ten-colour calico printing machine, driven by one of Messrs. Mather and Platt's patent Manchester motors. We now describe the other exhibit of this firm in the Electric Lighting Department. The portion of this department, adjoining the Machinery in Motion Section, has been reserved for the electrical plant for lighting the Fine Art Galleries, fourteen in number, which are situated on the north side of the eastern nave. Both engines and dynamos have been constructed by Messrs. Mather and Platt, of the Salford Iron Works, Manchester. The engines have been specially designed for electric lighting work, and embody several interesting and novel features. In their general arrangement, and in the method of driving, Messrs. Mather and Platt have specially held in view the requirements for a central station installation, or a large mill installation, where economy of floor space is usually of primary importance. When the engines are worked to their full power, and the dynamos replaced by the next standard larger size, the whole plant would be capable of supplying current for 4,000 lamps of 16-candle power, while the total floor space occupied does not exceed 30 by 20 feet. Another essential condition of electric lighting engines is a sensitive, quick-acting, automatic cut-off. This is accomplished by an entirely new form of cut-off valve, recently patented by Messrs. Mather and Holgate, which is described below. The engines are of the vertical, high-pressure, condensing type, with a single inverted cylinder, 20-inch diameter and 30-inch stroke, intended to run at 120 revolutions per minute, and to work with a boiler pressure of 100 lbs., and under these conditions will each indicate about 200 horse-power. The two engines are entirely independent, each having a separate fly-wheel, and independent off bearings, but they are connected together by a bridge to give access to the cylinders and valves.

The cylinders, cylinder slide, and crank bearing pedestal are cast in one piece with the trunk or frame, which is of a box section, closed entirely back and front, but open at the sides. The frame is very rigid, and looks massive and substantial in design; at the same time, as the frame casting is only $\frac{3}{4}$ -inch thick, it is actually not so heavy as it appears. The cylinder is fitted with a loose liner, which forms the steam jacket. The valve box is bolted on loose, and has double slide valves, so as to get straight ports from the valve box to the cylinder. In the main slide valves, the ports are straight on the cylinder side, but the passages are obliquely directed within the block of the valve, so that the ports on the off side are curved, the edges being circular. The main valves are worked in the usual way with an eccentric on the crank shaft. The cut-off valves work on the back of the main valves with a reciprocating motion, also derived from an eccentric on the crank shaft. These valves have curved edges corresponding to the curvature of the ports of the main valves, and are carried on pivots fixed in the slide block. The cut-off valves can thus turn about an axis at right angles to the axis of the cylinder, in addition to their rectilinear reciprocating motion. The point of the stroke, at which the steam is cut off, depends upon the angular position of the cut-off valve, which is regulated directly by the governor through a suitable series of levers. This form of cut-off has given exceedingly good results on small engines. Applied to an ordinary horizontal engine, indicating 20 horse-power, it was found that when 50 per cent. of the whole load was suddenly thrown off, the momentary variation in speed did not exceed 4 per cent., which was immediately reduced to $1\frac{1}{4}$ per cent., and that, with the whole load suddenly thrown off, the rise in speed was $2\frac{1}{2}$ per cent. only. The piston rod and crank pin are steel, and the connecting rod best hammered scrap. At the crosshead end, the connecting rod is forked, and the wear taken up by a wedge and screw; its length is three times the stroke. The crank is of steel, and balanced and covered with a cast iron shield. It is shrunk and keyed on the shaft. The crank pin is also shrunk in. The shaft is 8-inch diameter, bossed up to $8\frac{1}{2}$ -inch for the fly-wheel, and at the crank end is carried in a bearing 15-inch long, and at the off end in an angle pedestal 12-inch long and $6\frac{1}{2}$ -inch diameter. The main bearing is adjustable at top and bottom and at the sides by wedges and screws, so that the brasses can be fixed in any way while the engine is at work. The fly-wheel is 12-feet diameter and 30-inch wide, and is prepared for two 13-inch belts. It was cast whole, split, and bolted together at the rim, and held with bolts and shrunk loops at the boss. Its finished weight is $5\frac{3}{4}$ tons. All the bearings, the eccentrics, crank pins, &c., are lubricated from one oil tank, to which the oil is pumped from a tank at a lower level, into which it collects from the drippers. The cylinder is lubricated by Messrs. Mather and Platt's improved sight-feed lubricator, requiring one plug valve only. The air pump and condenser are of the ordinary vertical type, fixed below the floor. The pump is single-acting, 12-inch diameter, 15-inch stroke, and is worked by a beam from the engine crosshead. Throughout, all threads on bolts are fine pitch or gas threads, and in working parts have a nut of ordinary depth locked with a thin one, and, in addition, have a split cotter through the end of the bolt. The left-hand engine drives two "Edison-Hopkinson" dynamos, shunt-wound, each giving an output of 105 volts, 320 ampères, at a speed of 750 revolutions per minute, equivalent to 500 lamps of 16 candle-power. These machines were awarded a gold medal at the International Inventions Exhibition, and have a higher recorded efficiency than that of any other dynamo. By tests made in the presence of impartial judges, it was found that they had a commercial efficiency of 93.3 per cent., and an electrical efficiency of over 95 per cent. The improvements made in these dynamos by Dr. John Hopkinson and Messrs. Mather and Platt, since the original Edison type, are effectively shown by comparing the two smaller Edison-Hopkinson dynamos with the four Edison dynamos of the old type which are at work close by. Although only about one-third the weight of the Edison dynamos, the Edison Hopkinson dynamos have a larger output and much higher efficiency. The right-hand engine drives two "Manchester" dynamos, compound-wound, each giving an output of 100 volts, 400 ampères, at a speed of 750 revolutions per minute; equivalent to 700 incandescent lamps of 16 candle-power. Nine of these dynamos have been supplied by Messrs. Mather and Platt for lighting the entire Exhibition buildings at Saltaire. They comprise four series wound high tension dynamos for are lighting, three compound-wound dynamos for the incandescent lighting in the Art Galleries and Dining Rooms, one shunt-wound machine for charging accumulators, and one series-wound machine for working the powerful search light in the lighthouse. The efficiency of the "Manchester" dynamo is also very high. With the full load, the electrical efficiency is 94.8 per cent., and the commercial efficiency 92.8 per cent. These dynamos, as also the Edison-Hopkinson, are driven direct from the fly-wheels of the engines with link belts. In order to increase the lap of the belt on the pulley of the dynamo, it is bent on its slack side under a loose pulley riding on a stud carried on an arm projecting from the dynamo bed. This system of using a "jockey" pulley instead of a long belt is very effective when it is desirable to economise floor space. It was introduced by Messrs. Mather and Platt some years ago for dynamo driving, and has given good results. Careful experiments show that there is very little friction in the arrangement, and no undue wear of the belt. The belts employed for driving the dynamos are worthy of notice, as instead of having flat faces, as is usual with link belts, the section is double concave, so that the pins are not bent as the belt is bent over the convex surface of the pulleys.

PATENT ELECTRIC CLOTH SINGEING MACHINE.

It is well known that an electric current, when passed through any metallic conductor, develops heat in the conductor, owing to the resistance which the metal opposes to the flow of the current. The heat developed depends both on the quantity of electricity passing and the dimensions and properties of the metallic conductor. Thus, platinum has a resistance six-fold that of pure copper, and, consequently, a current, which would only slightly warm a copper bar, would raise a platinum bar of the same dimensions to a white heat. It is this property of the electric current which is utilised in the electric singeing machine. There are, at present, two methods generally in use for removing the nap from

silk, cotton, and linen cloths and other fabrics. The one is the system of the plate-singeing stove, in which the cloth is passed over plates of copper, heated to a bright red heat by an ordinary furnace: the other, more modern method, is to remove the nap by passing the cloth over a series of burners, with oxy-hydrogen flames. The electrical singeing machine may be used to replace either of these methods. It consists of a frame provided, as in the ordinary plate-singeing stove, with entering rails, draw rollers, water box, and wince, driven by a small independent engine, or from shafting, or (as may in some cases be convenient) by a small electromotor. But, in place of the copper plates or row of gas burners, the singeing is effected by two or more thin platinum bars or plates, carried on special fire bricks, which diminish the conduction of heat from the bars to the cast iron channel in which the bricks are held. The plates are heated to a bright red heat by the passage of an electric current produced by a dynamo machine. The cloth is pressed down upon the plates by two bars, under which it passes, the pressure being regulated by a suitable lever, placed in a convenient position at one side of the machine. There is also an arrangement for quickly lifting the cloth from the plates in case of stoppage. The temperature of the plates is regulated by varying the intensity of the magnetic field of the dynamo, which is readily done by inserting resistance in the magnet circuit. A switch, controlling this resistance, is placed on one side of the machine, or in any position which may be found most convenient. The power required for driving the dynamo is proportional to the heat generated in the bars, and the current can be instantaneously cut off, and no power absorbed, immediately the batch of cloth has passed. In order to bring a fresh part of the glowing surface of the plates continuously into contact with the cloth, a rocking motion through a small arc is imparted to them from the driving gear of the machine. The advantages of the system may be briefly enumerated as follows:—(1) The machine is always ready for use. If the cloth is at hand, operations can be commenced in less than half a minute. This is a very great advantage over the plate system, in which at least an hour is required to get the plate hot enough for work. (2) The plate can be maintained at one uniform temperature for any length of time. (3) The temperature of the plate is entirely under control, and can be instantaneously regulated at will, and the cloth more or less singed as required. (4) No more of the plate than is required need be heated; and the length may be reduced to suit any width of cloth. (5) A plate, when worn out, can be replaced by a new plate in a few minutes by an ordinary workman. (6) The plates never require chipping nor filing, as the surface keeps good until the plate is worn away. (7) There are no offensive products of combustion to be dealt with, and nothing given off from the plates except the burnt dust from the nap. A plate singeing stove requires a chimney for the furnace; and a gas singeing machine, pipes and fans for drawing off the products of combustion of the gas. (8) Being absolutely clean, the machine is serviceable alike for singeing cloth in the grey state, or bleached or dyed. (9) The dynamo supplied for working the singeing machine may also be used for electric lighting, whenever the singeing machine is not at work. It is claimed for the Electric Singeing Machine, that, in addition to the advantages enumerated above, it is also much more economical than the present methods of plate and gas singeing. From careful trials, it has been found that about 20 indicated horse-power is required to drive the dynamo for working a singeing machine with three plates capable of singeing cloth up to 4 feet wide. With ordinary plate singeing stoves, the average consumption of fuel is 10 cwt. of best coal, at 13s. 4d. per ton, per day of nine hours = 6s. 8d. or £2 per week of 54 hours. With the equivalent electrical singeing machine, taking 20 horse-power, and allowing 3 lbs. of coal per horse-power-hour, as an average allowance for a modern engine and boiler, the amount of coal used would be 1½ tons per week. The price of engine coal may be taken at 7s. per ton; hence the cost of fuel for the new system may be taken at 10s. 6d., as compared with £2 for the old method. To this must be added the saving effected from (a) The machine being ready for immediate use every morning, as the engine which drives the dynamo will, in the majority of cases, be supplied with steam from the ordinary boilers which supply the works. (b) Economy in labour; there being no coals to get in and put on, no ashes to cart away. (c) No re-setting of plates. The length of time which a platinum plate will last has not yet been determined; but from actual trials, extending over a year, it is calculated that they will last twelve months in constant use, and the old plates are allowed for in ordering new, at, at least, one-half their original cost. Messrs. Mather and Platt also exhibit a complete set of their patent Elastic Metallic Piston Rings, and models of their patent Friction Clutches, Opening Rollers, and other specialities. They have also at work a model of the Bessbrook and Newry Electrical Tramway, the electrical apparatus for which was supplied by them. This tramway,

which is worked entirely by water power, has now been in operation two years, and has given most complete satisfaction, shewing very economical results in the cost of haulage. It is remarkable as being the only electrical tramway in existence—either in this country, or on the Continent, or in America, where goods are regularly hauled together with passengers. The trains are generally composed of an electrical locomotive passenger car, drawing six goods waggons, carrying 12 or 15 tons of coal or minerals. During the last two years, 20,000 tons of goods have been drawn, and the cars have run 30,000 miles, while over 150,000 passengers have been carried.

MESSRS. J. H. RILEY AND CO., BURY.

This firm exhibit, at work, a group of machinery, mostly for use in finishing linen and cotton goods; in addition to which, they show a velvet folding machine; three steam drying cylinders, with framing, and Riley's patent vacuum valve motion, to prevent collapse of cylinders; a diagonal steam engine, 7-inch by 10-inch, useful for driving separate machines; a small oscillating steam engine, 5-inch cylinder, and various sizes of Hunter's patent clutches. The patent folding machine for velvet, shown by this firm, is adapted for use in warehouses. We are informed that there are at present more than one hundred of these machines at work in Manchester alone. As it can be operated either by hand or by power, they are likely to claim a great share of attention. By reference to Fig. 1, our readers will be able to gain some idea of the arrangement of parts, and when they learn that, with only one boy to attend to the machine, twice as much work can be completed in a given time, as by two boys on the old system, and that the folding is done much more satisfactorily, they will understand the advisability of inspecting this machine for themselves.

A beetling machine next claims our attention. This is a 14-foot roller beetle, with 40 beech fallers of large size. The wiper shaft is fitted with 40 tappets of very strong section, put on the shaft singly, as preferred by most users. The rise of the fallers is 11 inches. The cloth beams of this beetle are provided with self-stripping motion, as well as with the ordinary cam or wave motion. The whole machine is driven by a 5-inch shaft, on which are fitted a pair of 30-inch friction cones and a bevel pinion which gears into a larger bevel fixed on the end of the wiper shaft, both wheels being very fine specimens of machine-moulded toothed gearing. As it now stands, the machine represents a single beetle, with its share of gearing, taken out from a set of four or six beetles, and it can be added to an existing range, if required, with ease. At present, the only parts in

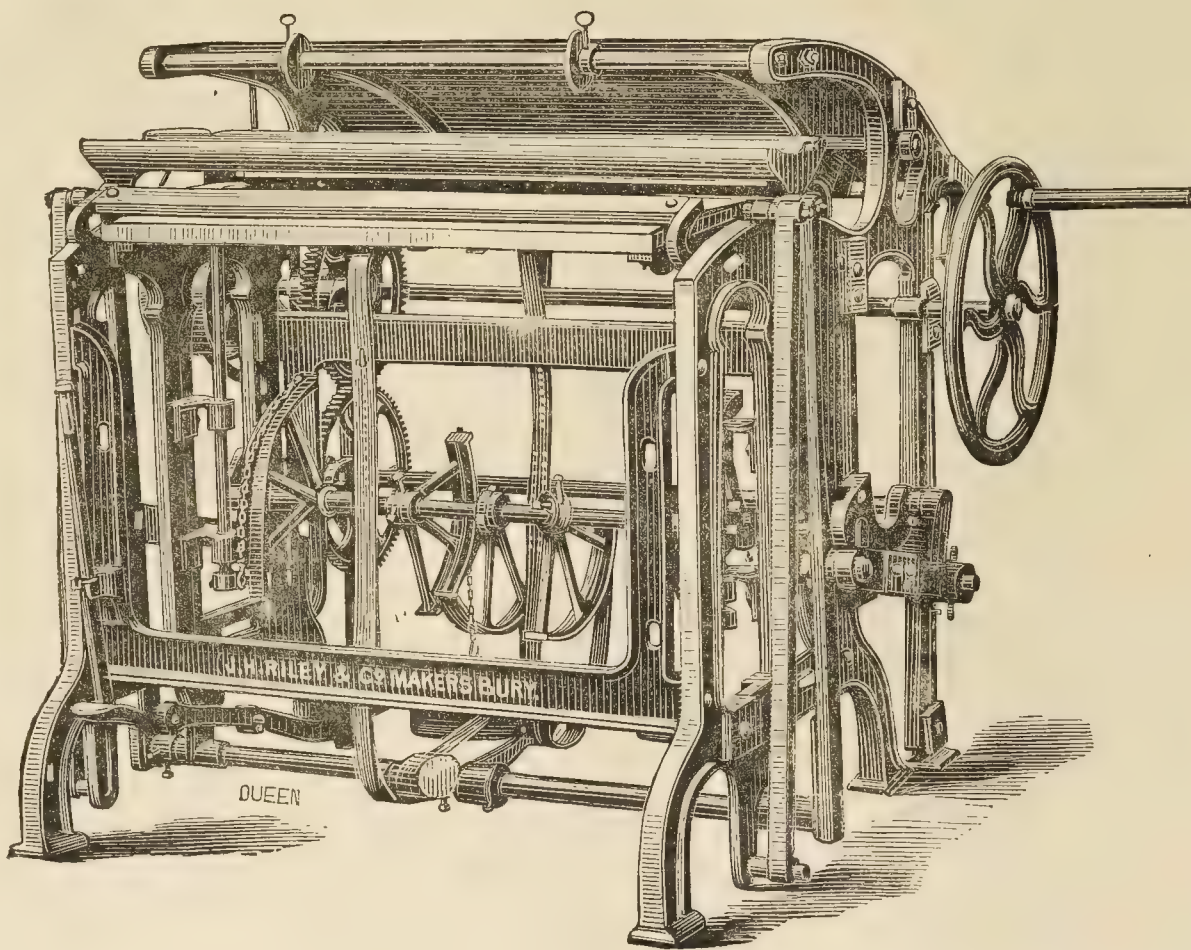


Fig. 1.

motion are the wiper or tappet shaft, and the stripping and cam motions, which are actuated by a neat diagonal engine, made by the firm for use in bleaching and finishing works. Next is an improved stretching or breadthening machine, for the use of bleachers, dyers, and finishers. In the processes of bleaching, dyeing, and finishing linen and cotton goods, the cloth is conducted through many of the operations in the form of a rope, and the effect of this constant drawing endways is to stretch the fabric, making it longer and narrower than when it was in the grey state, or when it came from the loom. To remedy this, the present machine is brought into use. The cloth is passed over the stave rails and on to a pair of large pulleys, running in an independent frame, and set at an angle inclining outwards. Where the cloth goes in the machine, the pulleys may be 40 inches apart, and where it comes out, they may be set at about 44 inches apart. The cloth, being held fast on the pulleys, is pulled out in width some inches, and is also shortened in length, so that, when it leaves this machine, it stands as to width and length the same as when it left the loom. The machine is strong, compact, efficient, and simple to work, and is provided with accommodating batch holders and surface batching motion. The frames that carry the large pulleys can be adjusted to suit the width of cloth, and the amount of stretch required from either the front or the back side of the machine, separately or together, by means of a hand wheel. The machine has been made from new patterns specially embodying all recent conveniences. The four-bowl, or universal calender, which we illustrate (Fig. 2) suitable for 50-inch cloth, and arranged for glazing, swissing, and chasing, is well worth the attention of users of this class of machines. It contains two large cotton bowls, with wrought iron centres, and 6-inch journals; one

bright chilled bowl, the surface of which is perfectly free from specks, and is fitted with gas heating arrangement and injector, which cause a clear blue flame to be carried the full length of the bowl, the waste matter resulting from combustion being drawn away by the injector. The bottom bowl is of cast iron, with wrought iron centre. The framing of the calender is massive, and in every way worthy the machine. The struts at each side are direct on their work, with a straight thrust to the head of the machine, rendering it very steady in its working. The lever motion is of the compound form, and, by introducing wrought iron pins, it can be turned into a "dead set" calender. When the operation of swissing is being carried on, it is necessary that all the four bowls should be in action, but for glazing, the top bowl is either taken off, or wound up a little above the hot bowl, this is done by means of lifting irons and hand wheels, arranged for the purpose, and the processes of

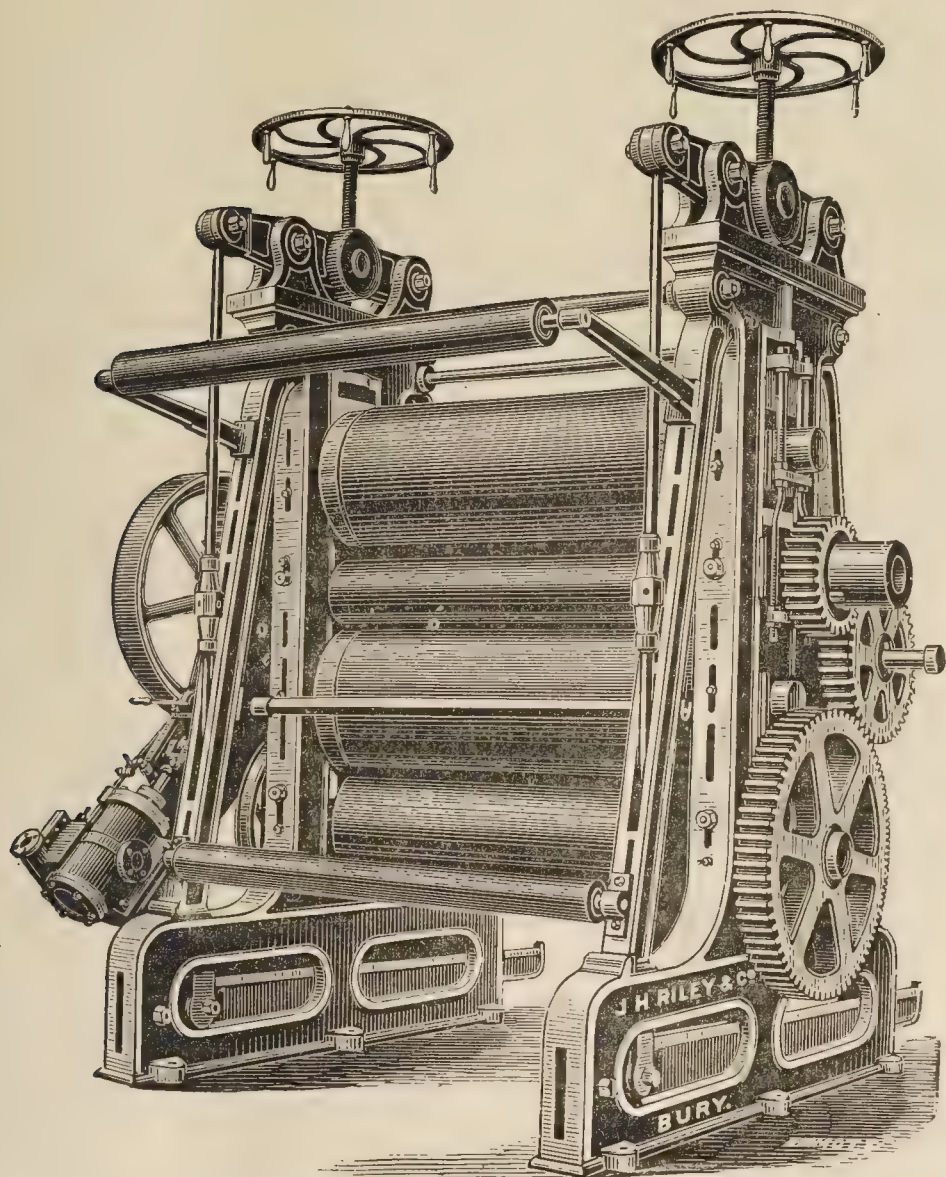


Fig. 2.

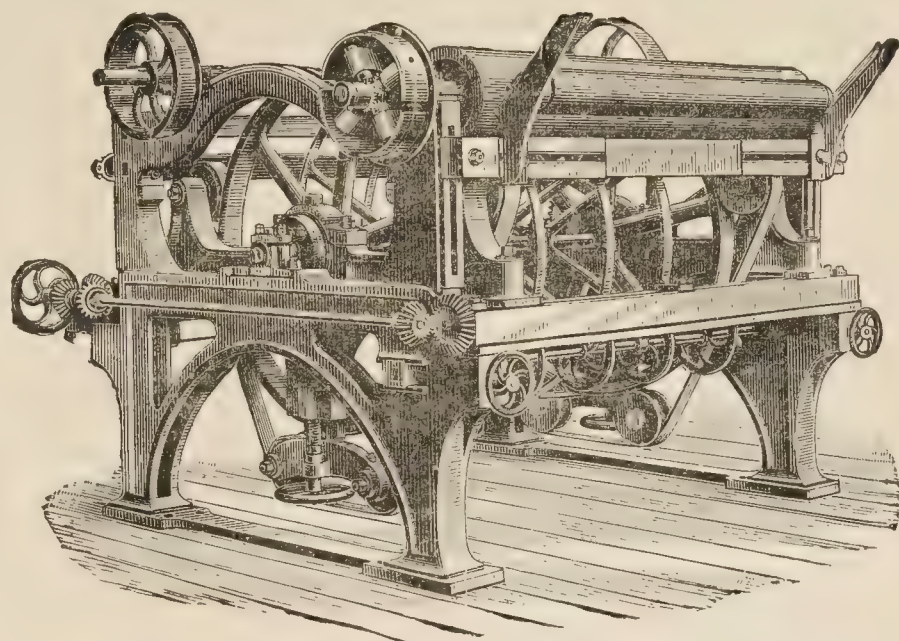
glazing and chasing are then carried on by the three lower bowls. The gearing of this machine deserves special mention. On the driving end of the chilled bowl a large helical spur wheel of strong pitch is keyed, this is driven by a suitable pinion, and a short 5-inch shaft carried by pedestals fitted with phosphor bronze steps, and supported by strong cast-iron framework. On the 5-inch shaft is fixed one of Hunter's patent clutches, having in connection with it a three grooved rope pulley, driven by three 1½-inch ropes from a similar pulley above. Disengaging levers are provided for putting the clutch in and out of gear, by use of which the calender can be started and stopped instantly, thus a workman, having perfect control over the apparatus, experiences no difficulty in catching the end of the cloth being operated upon.

THE ROSSENDALE BELTING COMPANY, MANCHESTER.

The whole of the dynamos driven from the main shafts are fitted with belting manufactured by the above firm, and supplied by one of their agents, Mr. Isaac Jackson, of Glossop, Derbyshire. The belts for the 35-light machines are 12 inch, and 9 inch for the 25 and 15-light machines. They are made by the patent anti-friction process, which effectually resists the action of the strap fork, and renders them strong, durable, economical, and efficient. In the manufacture of these belts, the warp and weft are woven with a composition which is self-lubricating, and which keeps them in a moist condition, thus giving them a grip upon the dynamo pulleys which has never been surpassed by any woven belting. We are informed that these belts are giving entire satisfaction to the various firms at the Exhibition, who are using them to drive their dynamos, as there is no slipping, and the lubrication is all that could be desired. We may add that the nature of the material used in their construction renders them impervious to the action of cold, damp, heat, and gases.

MESSRS. BENTLEY AND JACKSON, BURY.

At Stand 516, this firm show a cloth stretching machine, constructed with a roller feed at the back, the cloth being passed over a tension roller and guide rail to the stretching apparatus. On a shaft running through the centre of the machine are two pulleys, covered on their peripheries with india-rubber. These pulleys have turned bosses, which fit in bored bearings, formed in frames and carriages, and are so attached to the shaft that they can be swivelled. The frames can be swivelled by means of a hand wheel and the requisite gearing, the motion being given in either direction by a clutch box. It will be obvious that, when the india-rubber covered pulleys are angled in the manner described and revolved, they will tend to pull out the cloth width-ways. The cloth is taken up by a roller driven by means of a pulley on the end of its centre shaft, the pulley being capable of expansion. Its periphery is formed with four segments, to each of which a screw is attached, the latter working in a bevel wheel which forms the nut. The four bevel wheels revolve round a centre fixed pinion, and it is thus possible to diminish the diameter of the pulley to any given extent. By this appliance, the taking-up roller is always regulated to take up cloth without slack. They show, also, expansion pulleys, one pulley of an umbrella pattern, variable from 24-inch to 30-inch diameter, arranged to be adjusted, whilst running at any speed, by means of a hand wheel, lever and screw, applicable to all machines where exactitude is required, and where the material to be operated on is of a varying nature. They also have a pulley variable from 34 to 36-inch diameter, adjustable only when at rest, or when running at slow speeds, particularly applicable to paper machines, to adjust the tensions of the various sections of the machine, according to the material used. They have on view one centrifugal pump in

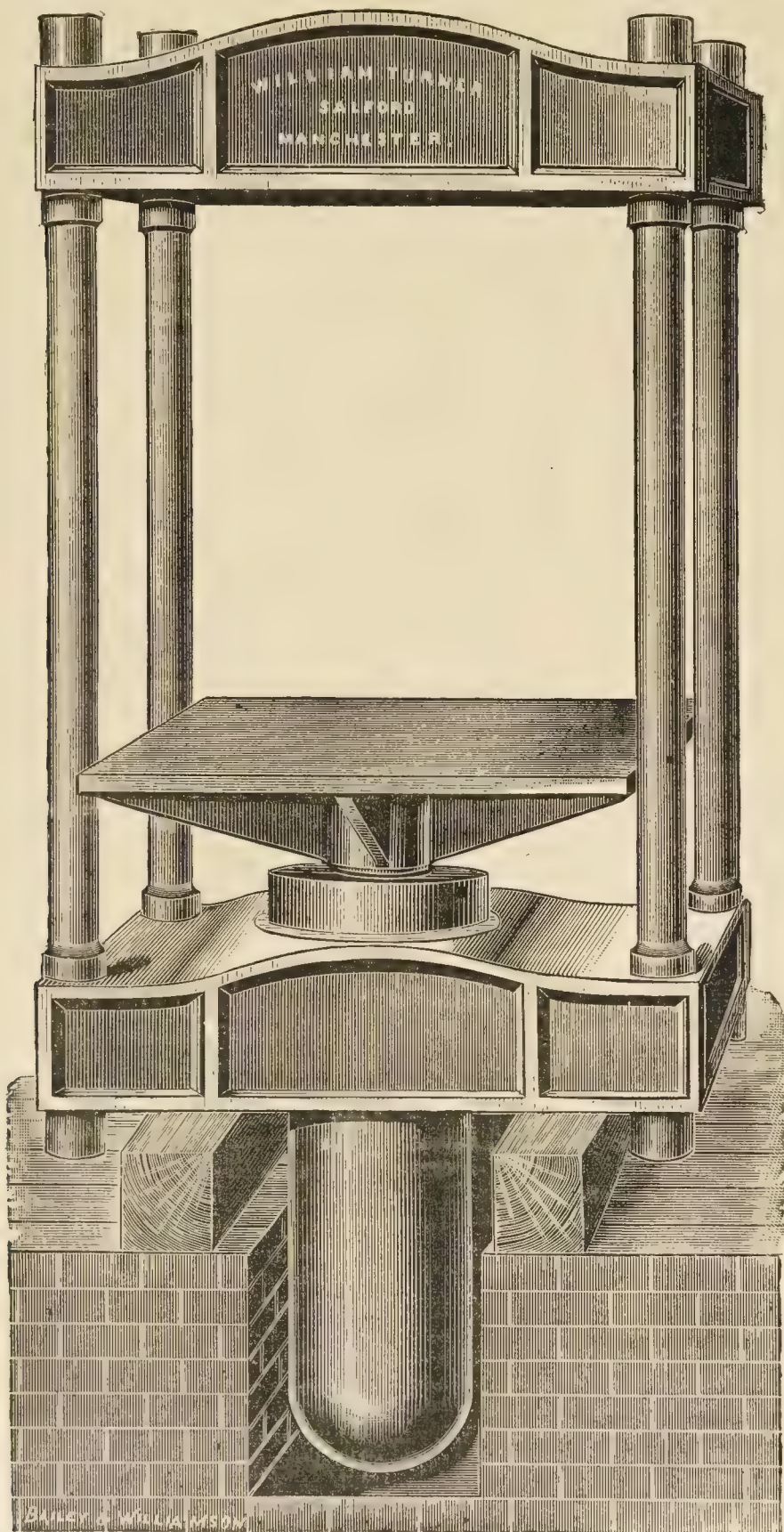


brass, the delivery and suction pipes are 5 inches in diameter, fitted with fast and loose pulleys, strap fork, bar and handle, for starting and stopping, suitable for paper mills and bleach works, or other works, for pumping water, lyes, bleach, or acids; also two improved brass ejectors for vacuum boxes of paper making machines, to be worked either by a jet of steam or a column of water. These ejectors are provided with adjustable conical spindles to regulate and economise the consumption of steam or water admitted, according to its pressure per square inch. There is, too, one chilled iron roll, 14-inch diameter, 52½-inch long on the face the necks 9 inch diameter, bored for heating by steam, gas, or heaters, and accurately ground and polished on their improved American roll grinding machine, suitable for finishing paper or cloth, india-rubber, linoleum, and for similar purposes; the firm exhibit one bowl 24-inch diameter, 44-inch long on face, made of woollen paper, with hammered iron centre, locking plates and wedges, finished on their improved American grinding machine, suitable for paper makers and bleachers, mangles and calenders; one bowl 20-inch diameter, 44½-inch long on face, made of wood fibre, "Oliver's patent," with hammered iron centre, locking plates, and wedges, also finished on their American roll grinding machine, suitable for bleachers, finishers, dyers, &c.; one set of Straightway steam valves, from 2-inch to 6-inch diameter; one 8-inch junction valve, all with cast iron bodies and hand wheels, gun-metal valves, seatings, spindles, tested by steam pressure; all guaranteed full wayed and tight at high or low pressure, constructed so that the spindles cannot blow out, and with special facilities for packing; one 4-inch water valve of simple and efficient construction, specially suitable for paper mills, bleach works, dye works, and similar purposes.

MR. WILLIAM TURNER, SALFORD, MANCHESTER.

Mr. William Turner, exhibits, at his Stand 419, machinery section, one of his hydraulic packing presses for packing cloth, leather, and various classes of manufactured articles. The press illustrated is an ordinary packing press for baling manufactured goods, and is fitted with cast-steel cylinder, turned and accurately bored to fit the ram, recessed and fitted with leather ram ring, and also with gun-metal connection nut for the pressure pipe. It has a strong moulded cast-iron top and bottom, the under side of the top is planed, and the bottom is bored out to receive the cylinder, both the top and bottom being machined to receive the columns. The latter are of the best hammered scrap iron, turned in the necks and shoulders to fit the recesses in the top and bottom, and secured in their places by cast-iron caps and T bolts and nuts, and machined to suit the roller guides on the press table. This table is a box casting, planed all over on the face, turned to fit the ram head, fitted direct to the ram, and with roller guides for the columns. The table also has hand pockets for the baling rivets. The ram is of cold-

blast cast-iron, turned and polished bright all over, and fitting true to the cylinder. All the materials used are of superior quality, and the press is fitted and finished in the best style. The press may be fitted with ordinary lashing plates, or with stillage, with moveable bars for different numbers of baling hoops, at extra charge. Every press is tested before being despatched from the works, and all the cylinders are tested to $3\frac{1}{2}$ tons per square inch. Mr. Turner also shows a variety of pumps, amongst which may be seen the "Salford Pump."—This pump is fitted on a strong cast-iron box bed plate, on which the pedestals are cast. The side columns, in one of which are the valve boxes, are securely fastened to the bed plate by bolts and nuts, each column being constructed so as to form an air vessel. This arrangement gives an air vessel on both the suction and the delivery sides, thereby greatly reducing all shocks, and enabling the pumps to be run at a



very high speed. The steam cylinder forms an entablature on the top of the engine, and the thrust of the piston rod and ram is direct. The crank shaft is arranged to work in the bed frame, and runs in gun-metal steps. The fly-wheel being at the base of the pump instead of half way up it, as in other vertical pumps, ensures perfectly steady running, its weight adding to—rather than preventing—the rigidity and steadiness which are so necessary to the long life of the pump and its efficient duty. The connecting rods are very long; this is another of the decided advantages of the pump, as the side thrust due to the crank is reduced to a minimum. The pump valves are of brass, with brass seats, and, being of large area, are very suitable for pumping sewage matter, tar, and other like liquids, without danger of choking. The pump barrel is fitted with gland and stuffing box, enabling the packing to be renewed without trouble in a few minutes. The valve boxes are so arranged that the valves can be inspected and, if necessary, renewed without difficulty, and the whole engine is so complete as to commend itself almost without description. The "Salford Pump" may be arranged either as a single or a double acting pump. The double pump is made on the same principle as the original single acting pump, only that it has two steam cylinders and two pumps on one frame,

the two fly-wheels being on either side of the bed frame, giving a perfect balance to the whole engine. In the "Salford Wall Pump" exactly the same design is carried out, but the engine is arranged to bolt to the boiler or to a wall, and it makes an attractive addition to the engine house—being neat, compact, and well made. These pumps have been supplied for feeding boilers, tanks, &c., and for almost all pumping purposes. It makes a first-class stationary fire-engine, as it is designed to run at a high speed. When not acting as a pump, it is also much used as a driving engine for mechanics' shops in mills, for sawyers, farmers, tanners, and in other cases where a small amount of driving power is occasionally required. The prices of the "Salford Pumps" are such as to ensure a good and well-finished engine, whilst they will compare favourably with the prices of other makers.

MESSRS. F. REDDAWAY AND CO., PENDLETON,
MANCHESTER.

There are many exhibitors of belting of every variety, from that made of leather, to those composed of various fibres. The old adage—"There is nothing like leather"—appears to have been placed, during late years, upon the list of doubtful truths, so far as belting, and such like goods, are concerned. Messrs. F. Reddaway and Co., are eminent as makers of this class of belting, a good display of which they have on view, consisting of "Camel" hair belting and Egyptian cotton belting; they exhibit, also, Canvas hose. The Camel hair belting is a remarkable specimen of this firm's productions, as the belt is no less than five feet wide, capable of transmitting 1,000 I.H.P., and solidly woven in a fine texture. It has been made specially to order for a large firm of Yorkshire manufacturers. This description of belting possesses many advantages, foremost amongst which may be mentioned its strength, combined with durability. It also has great powers of adhesion to the pulley, whilst its imperviousness to excessive damp or heat makes it specially adaptable for textile factories, where variations of temperature occur. Its cheapness is another feature in its favour. These remarks may be equally applied to the Egyptian cotton belting shown by this firm, and which is manufactured, as its name implies, from Egyptian cotton of the best long staple quality. The leading example of this class is a belt four feet wide, capable of transmitting 650 I.H.P., manufactured for one of the leading Lancashire firms, by machinery of special construction, invented by one of the principals of the firm. The great strength of this belting will be best understood when we state that a 6-inch 8-ply belt stands a strain of 17,930 lbs. As makers of Canvas hose, Messrs. Reddaway are well known, and their display in this branch should interest manufacturers, as, in these progressive times, every firm of importance possesses its own fire brigade, or, at least, has every department fitted with all requisite appliances for the speedy extinction of fire. The hose named the "Curfew," and that designated the "Manchester," claim special mention in this notice. The "Curfew" is manufactured with the warp threads thrown in a diagonal form, besides which a double casing of warp is thrown on the outside of the hose; these advantages increase its resisting power and prevent wear and tear. The "Manchester" hose is also manufactured to prevent wear and tear by a patent process invented by Mr. Reddaway. It is made from the best Irish flax linen yarn, and its durability, strength, and tightness under pressure are very great; its average bursting pressure of $2\frac{1}{2}$ inches, when new, is 500 lbs. per square inch. It is specially adapted for, and is largely used by, the principal fire brigades throughout the country. Besides the machine made hose manufactured by this firm for steam and manual fire engines, they produce hand made hose of the best quality. A visit to the Stand occupied by Messrs. Reddaway and Co., will forcibly demonstrate the position they hold amongst makers of belting and hose, as their display is to be seen surrounded by announcements of the highest awards they have obtained at the leading exhibitions held from time to time in various parts of the world.

MESSRS. MERRYWEATHER AND SONS, GREENWICH
ROAD, LONDON.

This firm, who are well-known makers of all kinds of fire brigade apparatus, exhibit their New Patent Double Cylinder High Speed Steam Fire Engine, "Greenwich," which received the highest award at the International Inventions Exhibition, London (1885). The increasing demand for powerful steam fire engines induced this firm to develop their well-known double cylinder engine, and to adapt it to run at high speeds. Keeping in view the fact that, although a slow speed engine with a long stroke has many advantages, it cannot compete with a high speed engine in point of lightness, Messrs. Merryweather have constructed one which, while it possesses all the most desirable features of the old double engine, combines with them so many novelties and improvements as to make it possible to obtain from the engine as much work, with a reduction of more than 20 per cent. in weight, without reducing its strength and durability. The patentees claim the following special advantages for their Greenwich engine:—It is lighter than any other, as compared with its power and performance. The boiler not only raises steam with greater rapidity, viz. from cold water in three minutes, and to 100 lb. pressure in about six minutes, but has an extraordinary capacity for maintaining steam, and will furnish more than can be used under ordinary conditions. It can also be worked with the inferior quality class of coal. The engine, being mounted on high wheels, and the axles placed between the front of the boiler and the fore-carriage, there is accommodation for two spacious coal bunkers, and the boiler can be fired and attended to *en route*, an advantage not possessed by

most fire engines. The steam cylinders and pumps are placed horizontally, this arrangement being a special feature of Messrs. Merryweather and Sons' various engines, as they hold that the horizontal motion is better suited for pumping work than the vertical. Vertical engines allow the oil from the cylinders to run down the pump rods, injuring the india rubber valves, so that the engine standing in the engine-house would be unfit for work when taken to a fire, thus the proper direction of the water is effectively maintained, whereas, in the case of pumps placed vertically, the flow of the water is subjected to more or less check and disturbance. The engine is direct and double-acting, the motion of the steam piston being given direct to the water piston by a pair of steel piston rods, the friction is, therefore, reduced to a minimum, and is no greater when working through long lines of hose than when performing the lightest duty. This arrangement is specially economical as regards the steam, as well as in respect of the oil and fuel, and it also ensures the smallest possible amount of wear and tear to the working parts. The engine has, therefore, better staying qualities, and is specially suited for hard work and long pumping operations. The power being fully utilised, an arrangement is provided to assist the driver if the working parts are stiff through not oiling periodically, or if the engine has been out of use for any lengthened period. The weight of the engine is more equally distributed over the four wheels than in any other maker's engines. There is no fear of upsetting nor liability to derangement when travelling over the roughest roads or at high speeds. The parts are so well balanced that the vibration is reduced to a minimum, and there is hardly any oscillation when the engine is in operation. The machinery is peculiarly compact and well arranged. We would draw attention to the following additional advantages:—The novel construction of the pump, in which all the valves are arranged below the barrels, so that stones or other foreign matter which would injure the cylinders are allowed to fall to the bottom of the suction chamber, and do not pass through the pump. There is an arrangement for easy access to all the pump valves, by removing the suction box carrying the suction valves, and the plate carrying the delivery valves, which are both held in position by the same studs fixed in the main pump casting. The construction of crossheads is novel, whereby a long connecting rod and consequently easy running are secured without lengthening the engine. The engine is so evenly balanced that no fly-wheel is required. The engine is stoked from behind, and not at the side (as with most other maker's engines), and steam can, therefore, be raised *en route* to a fire. The special form of the air vessels and the manner in which they are fixed to the pump in connection with the large waterways, combined with the general design and construction of the working parts, admit of the engine being worked at very high speeds if required. The pumps are made of gun-metal in one piece, and, as the water nowhere comes in contact with iron, there is no rust in the pump, however long it may stand unused. The waterways are the most direct and the largest of any in use on a fire engine, proportionate to its size. The boiler is hand-made and of the very best material. In its construction, special provision is made for contraction and expansion. It is lighter in proportion to its steaming powers, strength, and durability than any other. The steam pressure is under complete control, as the engine is fitted with a perfectly reliable and absolute safety valve; the blow-off can, therefore, be adjusted to any required pressure with the greatest readiness and facility. The general design and construction are exceedingly simple, and the engine is, therefore, less liable to accident or to get out of repair than any other. Any person with ordinary mechanical knowledge can easily understand the details, while it may be safely worked by an unskilled stoker. All the valves and fittings are easily accessible to the engineer, and can be worked with facility. Dirty or salt water can be pumped without injury to the valves, cylinders, and machinery. The engine works in any position and requires no levelling up or adjustment. It is so constructed that the line of pressure is contained within the engine, and is entirely independent of the carrying frame, thereby giving the greatest strength, with the least natural weight. The engine is so entirely under the control of the engineer that it will deliver either 50 gallons per minute, or its maximum capacity. This advantage is especially important when the engine may be used in districts where the water supply is inadequate. It can work more advantageously up rising ground, and through long lines of hose, than any other maker's engine, owing to the steady, even pressure maintained in the hose. The makers claim that this engine is the lightest, simplest, strongest and most powerful form of steam fire engine yet introduced, proportionate to its size.

MESSRS. HACKING AND CO., BURY.

This firm show a Fancy or Gingham Loom which has a 36in. reed space, and is fitted with a loose reed. The treading is plain, and the loom is provided with a four-shuttle drop-box. The motion for working the drop box is a positive one, the changes being made, both up and down, by means of eccentrics. The eccentrics are so arranged that the motion of the smaller of them lifts one box only, and that of the larger lifts the box the height of two shuttles, while, when the two eccentrics are operated, the change is made from the first to the fourth box, or *vice versa*. The eccentric does not revolve, but merely oscillates from its front to its back centre, and being connected with the lever, which lifts or lowers the boxes, the change of centre is in this way followed by the motion of the boxes. The eccentrics are operated by means of vertical rods or hooks, which at their lower end give the necessary motion to a disc on which is a sector gearing with one formed on the eccentric. The motion is self-locked, so that no motion is possible until the hooks are lifted. This is done by a lifter rod, worked from a cam, and the hooks are pushed out of the way of the lifter by the ordinary pattern card arrangement. The cam, operating the lifter rod, is so arranged that, if the shuttle stops half way in a change, the cam can move sideways and break the connection with its driver. Another improvement of definite value is found in an oscillating lever, so arranged as to prevent the

shuttle going over too far when making its traverse, but being moved so as to allow the picker to be clear before the box makes its change. The loom has the usual chain and weight letting-off motion and positive taking up. It is a very good sample of high-class workmanship, and its motions are neat and effective. The construction is of such a kind that all the moving parts have ample strength to resist the shocks which are resultant on the use of drop boxes.

A Folding Machine shown is of a much more substantial and mechanical construction than is usually the case, being made with ample strength to ensure accurate work. It is, of course, made with the usual oscillating arm carrying two folder blades at its head, and which is adjustable in its traverse, so as to fold or measure any length. The holding rails are, however, arranged on a new plan, to rise when the cloth is being laid under them, so as to avoid the possibility of any fraying of light fabrics, and to allow of efficient folding of heavy goods. Each of the holder rails are sustained by two vertical arms, which are drawn downwards by cams having an oscillating motion. The cams are so constructed that the arms are released just before the knife passes under the holder, and a spiral spring pulls the latter up to allow of a free passage of the folder blade. As soon as the blade recedes, the cam in its return motion pulls down the holder and grips the piece firmly. The arrangement is an ingenious one, and makes the machine more perfect in its working than it otherwise would be. The whole exhibit is not a large one, but both machines are highly creditable to the maker.

MESSRS. DOBSON AND BARLOW, KAY STREET WORKS, BOLTON.

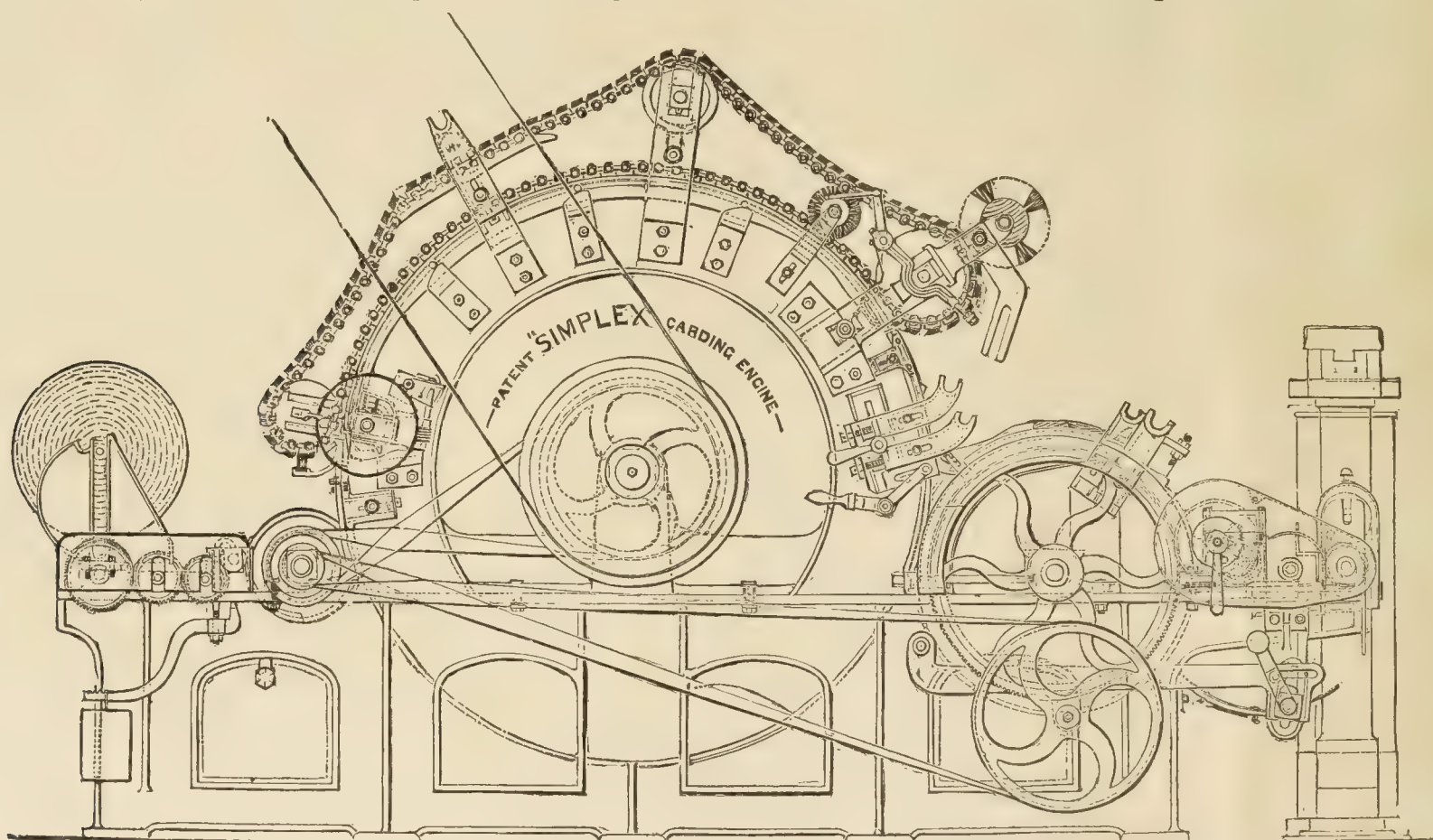
This well-known firm, who are manufacturers of machinery for preparing, spinning, and doubling cotton for coarse, medium, and fine counts, exhibit two complete systems of preparing and finishing machines, numbering seventeen in all, these comprise all the latest improvements. The first to come under notice is a double cotton opener, constructed from entirely new and re-modelled patterns, with spacious opening and effective cleaning power, and embracing one porcupine cylinder 37 inches in diameter, and one beater 18 inches in diameter, with lap apparatus attached. There are patent adjustable beater, and dust-box bars, which can be regulated whilst the machine is in motion, every facility being given for the lubrication of the different parts. With the machine is also a cone feed regulator, driven by band, and having a new and improved pedal motion which acts on the cone strap with the least irregularity of feeding. A tightening motion is applied to the cone drum strap which will save cutting and piecing when the strap becomes slack in the ordinary course of working. Next come two "Simplex" revolving flat carding engines, with patent automatic flexible bend adjustment, which admits of the flats being set to the cylinder to the two-thousandth part of an inch, with one adjusting handle. There are 110 flats, 1½ inches wide, upon this engine, and 44 constantly at work. Each flat and bend are tested by indicator and electricity to the whole extent of the wear of wire. The cylinders and doffers are clothed to the extreme edges, ensuring perfect selvages. Cards 38 inches on the wire, on this principle, will take ordinary scutcher laps for cards 40 on the wire, on the ordinary principle, thus giving greater production, and economising floor space. The cylinder necks work in phosphor-bronze bearings. Special improvements have been made in the mote knives, covers, and under-casings; they have also patent adjustable steel doffer cover and making-up piece combined; and a patent self-lubricating doffing comb motion. The takers-in are also covered with inserted saw tooth wire, to suit the different classes of cotton to be worked. The cylinders and doffers are specially balanced and trued up the whole of the surface. There is also a model of the flexible adjustment, showing the manner and accuracy with which the flexibles are adjusted. This is demonstrated by means of a mechanical tester or indicating apparatus. We noticed a sliver lap machine, designed for making the laps for the drawing frame, and patented ribbon lap machine combined, of which the firm are the patentees and makers. It consists of a drawing frame of the usual construction, fed by a lap made from an ordinary sliver lap machine; it can also be fed by slivers from the carding engine. This machine deserves the careful attention of those cotton spinners who use combing machines, its advantages being important. The lap being placed in the creel of the machine is drawn through four lines of rollers in the form of a ribbon instead of a sliver, and, by means of a curved plate, is placed perfectly even and level on a polished table. Each machine is fed by six laps, which, having been drawn through four lines of rollers into six ribbons, are placed upon the other with mechanical accuracy, and compressed by calender rollers, which also assist to convey them to the lapping machine, to be formed into a lap ready for the comber. The laps made upon this machine, having all the fibres perfectly straight, and the amount of cotton equally distributed, make from three to five per cent. less waste in the comber; the cotton is neither injured nor torn by the combs, neither are the combs injured or broken in the effort necessary to straighten crossed fibres, as scarcely any exist. It is stated by users of this machine that nine combers will produce the same weight when fed by it as ten combers fed with the ordinary lap machine; but, what is of far more importance to the spinner, the yarn produced from this machine is of greater evenness and strength. The next machine which claimed our attention was the combing machine. The object of combing is to remove the short staples and dirt left in after the carding of the cotton, and the operation is extremely delicate. The present machine is constructed with eight heads. An alteration is made in the former motion, at the end of the machine, for working the detaching rollers, which dispenses with the large detaching cam, the cradle, the notch wheel, the catch and its springs, the large spur wheel which drives the calender roller, and the internal wheels for the detaching roller-shaft, substituting a much simpler motion, consisting of a

smaller cam, a quadrant, and a clutch. The arrangement, having fewer parts, is also much more compact than the old one, for, with the driving pulleys in position, viz., outside the framing, the total length of the machine can be shortened ten inches, an important point in a room full of combers. The action of this detaching motion is positive, and enables the machine to be run at a higher speed without danger of missing, as happens when the point of the catch for the old notch-wheel becomes broken or worn away. Another important feature of the new arrangement is that it allows the motion of the detaching roller to be varied. By an adjustment, easily made in a few seconds, the delivery may be altered to suit different classes of cotton, or kinds of work, without the necessity of changing the cams or the notch-wheels. The nipper cam is placed in the centre of the machine to avoid torsion, or spring, in the shaft. An improvement has also been made in the construction of the nippers. In the ordinary comber, the upper blade has a groove in its nipping edge, and the cushion plate is covered with cloth and leather, the fibres being held by the grip between the leather of the cushion plate and the edges of the groove in the upper blade, or knife, as it is called. In Messrs. Dobson and Barlow's nipper, there is neither cloth nor leather on the cushion plate. Its edge is made into a blunt Δ , upon which the narrow flat surface of a strip of indiarubber or leather, fixed in the knife, falls to give the nip. By this plan, the cushion is applied to the knife instead of to the plate, which, of course, makes the cushion plate, after it has been once set, a fixture; it also dispenses with the accurate setting now necessary in the old arrangement. American cotton of $\frac{3}{4}$ ths staple to Sea Island of $2\frac{1}{2}$ staple can also be combed by this improved arrangement, an achievement which has previously been attempted without success. Messrs. Dobson and Barlow's improvements combine the important qualities of simplicity, perfection and cheapness. A very decided improvement has been made in the construction of the combing cylinder, by which the parts are fitted together

which prevents over-running and waste. There is no twisting nor intermingling of ends, and the machine will wind from cops, hanks, or bobbins. It is conducive to economy in packing yarn for export, and perfect selvages are attained, without heads to the bobbins. Messrs. Dobson and Barlow show also the patent stop motion reel for cops or bobbins, and many other mechanisms, all worthy the attention of spinners and manufacturers, but the space at our command does not allow of further description, and we must leave it to those interested to visit their stand and judge of the excellence of each exhibit.

Newcastle Jubilee Exhibition.

At the above exhibition, Messrs. Snowball and Co., Newcastle, exhibit Rodgers' Wrought Iron Split Pulleys, manufactured by Messrs. Hudswell, Clarke and Co., of Leeds, some of which are running the electric light, and other machinery, of the exhibition. These are the original wrought iron pulleys, made entirely of wrought iron, including the rims, arms, and boss, and are made in various sizes from 6 inches up to 24 feet in diameter, and are constructed to transmit any power that may be required. The pulleys are in the firm's usual quality and workmanship, and are well worthy the attention of those interested. Another section of this firm's stand comprises a collection of various kinds of shaft bearings, pedestals, brackets, flanged couplings, cast iron pulleys, and other shaft necessities. The workmanship of these is good, and the designs of a substantial nature. They also show in this section a milling machine, a universal radial drilling machine, and a centrifugal oil separator. Another portion of their stand is devoted to the specialities of the Kirkstall Forge Co.,



Messrs. Dobson and Barlow's Simplex Carding Engine.

by simple turning or boring, thus securing accuracy and interchangeability. The motion for working the top detaching, the leather, or the piecing roller, as it is variously called, is also improved and simplified, by reducing the number of pieces and securing an easier mode of setting. The brass tubes, which carry the lever detaching roller, have now square, instead of round, ends. Another good idea is the application of a treble brush carrier wheel, which permits of the brushes being driven at three different speeds, as they become worn. The machine works at a high speed—80 to 95 strokes per minute—with great smoothness and without noise, and, from the almost complete absence of vibration, the risk of breakage is reduced to a minimum. This firm have on view, also, a drawing frame, adapted for coarse counts, two self-acting mules—one for spinning fine, and the other for coarse counts of cotton yarn. To these mules is applied a patent automatic nosing motion, which gives a perfect nose to the cop, takes it entirely out of the minder's hand, and enables an increased length of yarn to be put on the cops. By this appliance, slack winding and "fuzzy" noses are obviated. They show further a ring and traveller throstle frame, one side arranged for spinning twist, and the other for weft, this frame contains many improvements, foremost amongst which we may mention Dobson's patent cork cushion spindle, and patent self-lubricating attachment. Their ring doubling frame, one side of which is arranged for preparing for thread manufacture, and the other for finishing purposes, is also supplied with the cork cushion spindle above named. One of the firm's patent quick traverse drum winding machines, with patent stop motion, is also worthy of attention. This winds yarn of from one to a hundred counts, with the same size of needles. The latter can be changed for any number of ends or kinds of yarn without displacing anything, and the machine will wind any number of ends from one to six. It is supplied with instantaneous stop motion to each end,

which include shafting in iron and steel, patent frictional couplings, axles, and bar iron. The shafting shown requires no turning, being perfectly straight and smooth, and ready for the bearing when it leaves the works. The specialities of the Kirkstall Forge Co. are well known, and, therefore, require no comment.



ORIGINAL DESIGNS.

On our first plate we give a design for a Toilet Cover, drawn by Mr. R. T. Lord, 97, Park Road, Bradford.

* * * *

Our second contains a pattern for a centre for Silk Handkerchief. It is the work of Mr. F. Layton, York Terrace, Akroydon, Halifax.

* * * *

We give on our third plate a pleasing design suitable for Cotton Damask. It may also be used for several other purposes.



TOILET COVER.



HANDKERCHIEF CENTRE.



DAMASK.



Woollen Suiting.

No. 466.

Warp:—

*	4 ends Black, 10 skeins twisted to small Black cotton thread.	} 4 times.
	3 „ Grey, 2/20 skeins woollen.	
	1 end Olive, 20 skeins twisted to Grey, 20 skeins.	
*	Design. 4 ends Black as before.	} Once.
	1 end Crimson, 10 skeins.	
	3 ends Grey, 2/20 skeins woollen.	
	4 „ Black as before.	
	3 „ Grey, 2/20 skeins woollen.	
	1 end Crimson, 10 skeins „	

Woven:—

4 ends Black as warp.	} 5 times.	Straight Draft.
4 „ Olive 2/20 skeins woollen.		
4 „ Black as warp.		
1 end Crimson „	} Once.	Pegged to fall.
3 ends Olive, 2/20 skeins woollen.		
4 „ Black as warp.		
3 „ Olive, 2/20 skeins woollen.		
1 end Crimson as warp.		

1,792 ends; 28 ends per inch; 28 picks per inch; 7's slay; 4 ends in a reed; 64 inches wide in the loom; 56 inches wide when finished.

Weight 24 ozs.

Finish clear and soft.

Woollen Trousering.

No. 467.

Warp:—

*	6 ends Black, 2/28 skeins woollen.
	3 „ Light Blue, „ „
*	Woven:—All Black weft, 2/28 skeins woollen.
	Design.

Straight Draft.

Pegged to fall.

Weight 24 ozs.

2,496 ends; 39 ends per inch; 40 picks per inch; 13's slay 3 ends in a reed; 64 inches wide in the loom; 56 inches wide when finished. Finish clear and soft.

Cheviot Suiting.

No. 468.

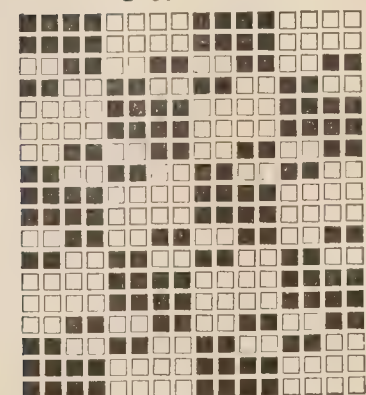
Warp:—

*	2 ends Claret Cheviot, 8 skeins woollen.
	2 „ White „ 10 „
*	Woven:—2 picks Claret, as warp.
	2 „ White, „
*	Design. Straight Draft. Pegged to fall. Weight 24 ozs.

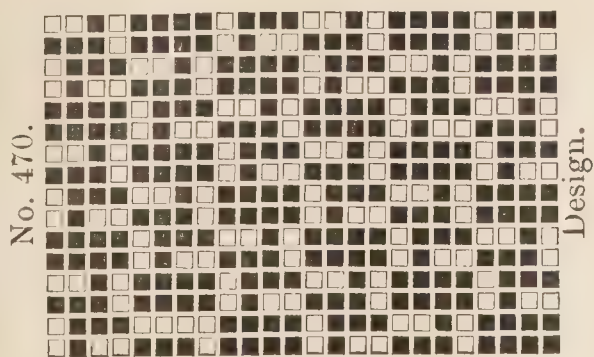
1,792 ends; 28 ends per inch; 22 picks per inch; 7's slay; 4 ends in a reed; 64 inches wide in the loom; 54 inches wide when finished. Cheviot finish.

Union Cloths.

No. 469.

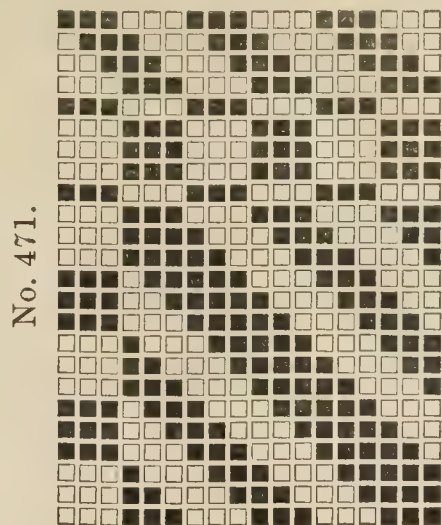


Design.



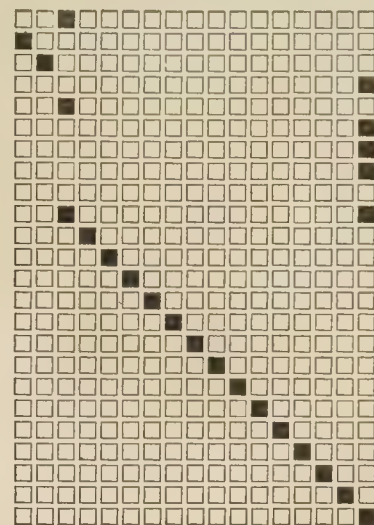
No. 470.

Design.

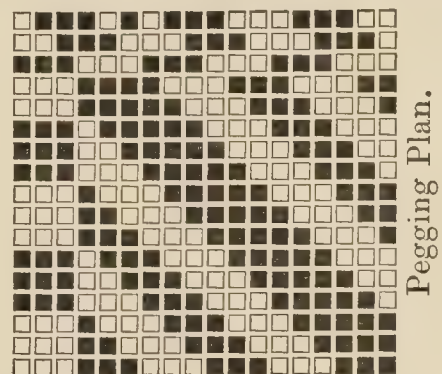


No. 471.

Design.



Draft.



Pegging Plan.

Warp:—2/24's cotton.

Weft:—12's worsted.

3,600 ends.

54's sett.

64 picks per inch.

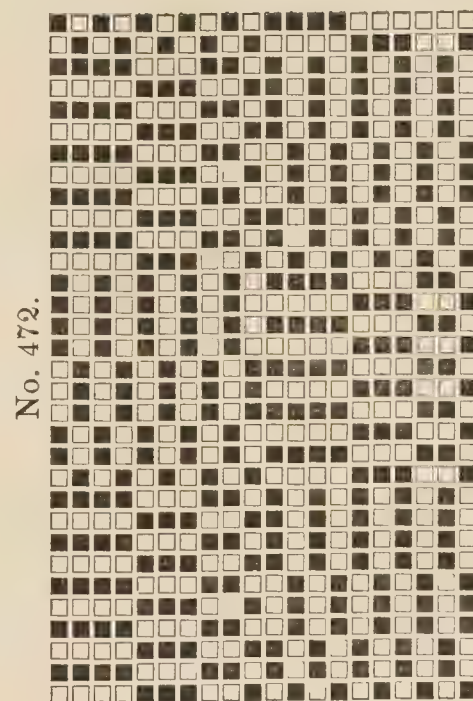
60 inches wide in the loom.

54 „ when finished.

Weight 12 to 14 ozs.

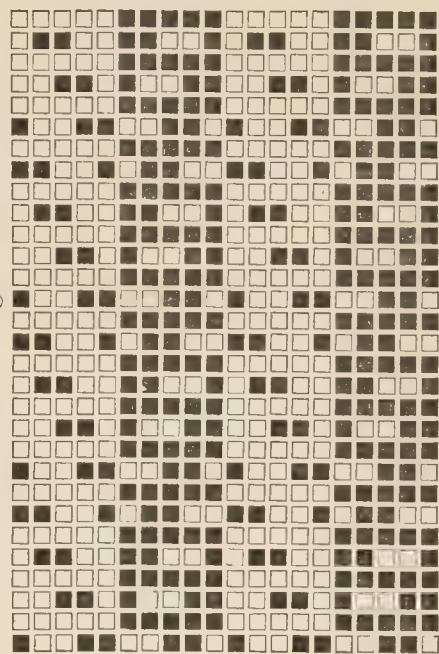
Worsted Coatings.

No. 473.



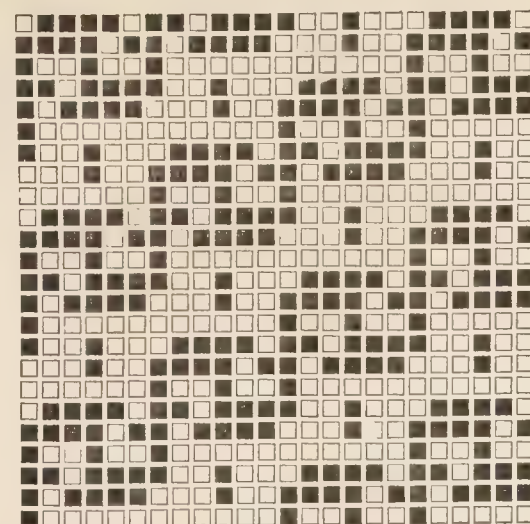
No. 472.

Design.



Design.

No. 474.



Design.

Warp:—2/28's worsted.

Weft:—13's worsted

4,350 ends.

60's sett.

60 picks per inch.

60 inches wide in the loom.

52 inches wide when finished.

Weight about 20 ozs.

Flax growing is being tried in Suffolk with prospects of success, and among the agriculturists making the experiment is the Right Hon. W. H. Smith, near Long Melford. If only a good crop can be obtained, without impoverishing the ground too much, a great benefit will accrue to Suffolk.

Merchandise Marks Bill.

We give below the leading clauses of a very important Act, the Merchandise Marks Bill, relating to cotton spinners, manufacturers, and shippers, and now awaiting the Royal assent. The measure will immediately become law.

(1) Every person who (a) forges any trade mark; or (b) falsely applies to goods any trade mark, or any mark so nearly resembling a trade mark as to be calculated to deceive; or (d) applies any false trade description to goods; or (e) disposes of, or has in his possession, any die, block, machine, or any other instrument for the purpose of forging a trade mark, or causes any of the things above in this section mentioned to be done, shall, subject to the provisions of this Act, and unless he prove that he acted without intent to defraud, be guilty of an offence against this Act. Every person who sells, or exposes, or has in his possession, for sale, or any purpose of trade or manufacture, any goods or things to which any forged trade mark or false trade description is applied, or to which any trade mark, or mark so nearly resembling a trade mark, as to be calculated to deceive is falsely applied, as the case may be, shall, unless he prove—(a) That having taken all reasonable precautions against committing an offence against this Act, he had at the time of the commission of the alleged offence no reason to suspect the genuineness of the trade mark, mark, or trade description; and (b) That on demand made by, or on behalf of, the prosecutor, he gave all the information in his power with respect to the persons from whom he obtained such goods or things; or (c) That otherwise he had acted innocently; be guilty of an offence against this Act. (2) Every person guilty of an offence against this Act shall be liable—(i) on conviction on indictment, to imprisonment, with or without hard labour, for a term not exceeding two years, or to fine, or to both imprisonment and fine; and (ii) on summary conviction to imprisonment, with or without hard labour, for a term not exceeding four months, or to a fine not exceeding twenty pounds, and in the case of a second, or subsequent, conviction to imprisonment, with or without hard labour, for a term not exceeding six months, or to a fine not exceeding fifty pounds; and (iii), in any case, to forfeit to Her Majesty every chattel, article, instrument, or thing by means of, or in relation to, which the offence has been committed. (3) The court, before whom any person is convicted under this section, may order any forfeited articles to be destroyed, or otherwise disposed of as the court thinks fit. (4) If any person feel aggrieved by any conviction made by a court of summary jurisdiction, he may appeal therefrom to a court of quarter sessions. (5) Any offence for which a person is, under this Act, liable to punishment on summary conviction may be prosecuted, and any articles liable to be forfeited under this Act by a court of summary jurisdiction may be forfeited, in manner provided by the Summary Jurisdiction Acts: provided that a person charged with an offence under this section before a court of summary jurisdiction shall, on appearing before the court, and before the charge is gone into, be informed of his right to be tried on indictment, and if he require be so tried accordingly. 3. For the purposes of this Act, the expression "trade mark" means a trade mark registered in the register of trade marks kept under the Patents, Designs, and Trade Marks Act, 1883, and includes any trade mark which, either with or without registration, is protected by law in any British possession or foreign State to which the provisions of the 103rd section of the Patents, Designs, and Trade Marks Act, 1883, are, under Order in Council, for the time being applicable. The expression "trade description" means any description, statement, or other indication, direct or indirect, (a) as to the number, quantity, measure, gauge, or weight of any goods, or (b) as to the place or country in which any goods were made or produced, or (c) as to the mode of manufacturing or producing any goods, or (d) as to the material of which any goods are composed, or (e) as to any goods being the subject of an existing patent, privilege, or copyright, and the use of any figure, word, or mark, which, according to the custom of the trade, is commonly taken to be an indication of any of the above matters, shall be deemed to be a trade description within the meaning of this Act. The expression "false trade description" means a trade description which is false in a material respect as regards the goods to which it is applied, and includes every alteration of a trade description, whether by way of addition, effacement, or otherwise, where that alteration makes the description false in a material respect, and the fact that a trade description is a trade mark, or part of a trade mark, shall not prevent such trade description being a false trade description within the meaning of this Act: the expression "goods" means anything which is the subject of trade, manufacture, or merchandise. The expressions "person," "manufacturer," "dealer," or "trader," and "proprietor," include any body of persons, corporate or unincorporate. The expression "name" includes any abbreviation of a name. The provisions of this Act respecting the application of a false trade description to goods shall extend to the application to goods of any such figures, words, or marks, or arrangement or combination thereof, whether including a trade mark or not, as are reasonably calculated to lead persons to believe that the goods are the manufacture or merchandise of some person other than the person whose manufacture or merchandise they really are. The provisions of this Act respecting the application of a false trade description to goods, or respecting goods to which a false trade description is applied, shall extend to the application to goods of any false name or initials of a person, and to goods with the false name or initials of a person applied, in like manner as if such name or initials were a trade description, and, for the purpose of this enactment, the expression false name or initials means, as applied to any goods, any name or initials of a person which (a) are not a trade mark, or part of a trade mark, and (b) are identical with, or a colourable imitation of, the name or initials of a person carrying on business in connection with goods of the same description, and not having authorised the use of such name or initials, and (c) are either those of a fictitious person or of some persons not *bonâ fide* carrying on business in connection with such goods. 4. A person shall be deemed to forge a trade mark who either (a) makes that trade mark, or without the assent of the proprietor of the trade mark,

a mark so nearly resembling that trade mark as to be calculated to deceive; or (b) falsifies any genuine trade mark, whether by alteration, addition, effacement, or otherwise; and any trade mark, or mark so made or falsified, is in this Act referred to as a forged trade mark, provided that in any prosecution for forging a trade mark the burden of proving the assent of the proprietor shall lie on the defendant. 5. (1) A person shall be deemed to apply a trade mark, or mark, or trade description, to goods, who (a) applies to the goods themselves; or (b) applies it to any covering, label, reel, or other thing in or with which the goods are sold or exposed, or had in possession for any purpose of sale, trade, or manufacture; or (c) places, encloses, or annexes, any goods which are sold or exposed, or had in possession for any purpose of sale, trade, or manufacture, in, with, or to any covering, label, reel, or other thing to which a trade mark or trade description has been applied; or (d) uses a trade mark, or mark, or trade description, in any manner calculated to lead to the belief that the goods in connection with which it is used are designated or described by that trade mark, or mark, or trade description. (2) The expression "covering," includes any stopper, cask, bottle, vessel, box, cover, capsule, case, frame, or wrapper; and the expression "label," includes any band or ticket, or a trade mark, or mark, or trade description, shall be deemed to be applied, whether it is woven, impressed, or otherwise worked into, or annexed, or affixed to the goods, or to any covering, label, reel, or other thing. (3) A person shall be deemed to falsely apply to goods a trade mark, or mark, who, without the assent of the proprietor of a trade mark, applies such trade mark, or a mark so nearly resembling it as to be calculated to deceive, but in any prosecution for falsely applying a trade mark, or mark, to goods, the burden of proving the assent of the proprietor shall lie on the defendant. Where, at the passing of this Act, a trade description is lawfully and generally applied to goods of a particular class, or manufactured by a particular method, to indicate the particular class or method of manufacture of such goods, the provisions of this Act, with respect to false trade descriptions, shall not apply to such trade description when so applied: provided that, where such trade description includes the name of a place or country, and calculated to mislead as to the place or country where the goods to which it is applied were actually made or produced, and the goods are not actually made or produced in that place or country, this section shall not apply unless there is added to the trade description, immediately before, or after, the name of that place or country, in an equally conspicuous manner, with that name, the name of the place or country in which the goods were actually made or produced, with a statement that they were made or produced there.

Consular Reports.

From a great number of "Consular Reports" before us, we select extracts from those which seem to bear most directly upon our interests as a nation of manufacturers. Consul Oxenham, in his annual report, says:—Commerce in China is almost entirely in British hands, and was so once in a greater degree than it is now. Like all monopolists, we have become apathetic and indifferent, and the energy and push and willingness to run risks, which once characterised British merchants, have succumbed to the deadening effects of monopoly. In the meantime, other foreigners profit by our supineness. Germans have the ear of high officials, and supply arms, guns, and ships; even the French are, for the first time, at last beginning to gain a commercial footing in China. In many parts, many of our merchants have made their fortunes, derive most of their income from land, and regard business as an agreeable and customary mode of employing their leisure hours. The old ways have suited them, and they have prospered in them, and they regard with indifference all attempts to provide new kinds of goods, to strike out new paths for trade, or in any way to adapt their goods and patterns to Chinese ways. The advent of foreigners to share in the trade was, and is, regarded with amusement and surprise, and is not believed to be in any way serious. Younger men, who have their fortunes to make, better understand the position, but they again depend chiefly on their seniors to obtain a footing in commerce. At the small ports more energy exists, and is indeed necessary, but energy in China must be combined with influence to obtain advantages. Englishmen, also, too often squabble and thwart each other, whilst foreigners combine with and assist each other all over China, astutely often egging on the disputants, and then stepping in to seize the prize. The Chinese officials know all this perfectly well, and act accordingly. Englishmen, again, will not advance with the times: the old cloths, the old patterns, the old qualities and prices, must suit the Chinese; but the foreigner, a trained, skilled man, on his metal to gain his living, and eager to adopt every change likely to attract Chinese customers, soon discovers the weak spots in our methods or manufactures, and changes or modifies accordingly. In many cases, he speaks Chinese, and is usually a fair linguist, whilst he is sure of official support at home and in China for his schemes. Matches, dyes, arms, railroad iron, sheetings, drills, needles—all tell the same tale. Foreign articles are cheaper and nearly as good as English, and drive them out of the market. The "awakening" in England, as in China, is perhaps at last beginning, and it is high time this should be the case in view of the competition in loans, goods, arms, ships, guns, and mail steamers; and, above all, in the trained, skilled, energetic men who are making their presence more and more felt every day in Commerce in China. If this pressure again revives the old British spirit of courage, enterprise, and energy, and brings to the front men properly skilled, trained, and equipped with knowledge and languages, the competition threatened will do more good than harm, and make us thank the foreigner for instilling fresh vigour into our actions at home and abroad.

At present, English discontent evaporates in grumbling, and little, or not enough, is done to remedy defects. To overcome difficulties has been the special business of Englishmen, and they are likely to have ample opportunities in the future to satisfy their ambition in this respect.

Vice-Consul Longford, in an elaborate report on the trade of Japan for 1886, speaks in the same strain as Consul Oxenham, dwelling on the failure of English merchants to adapt themselves to the requirements of their Japanese customers. He says:—The English import merchants in Japan are, without exception, men of as high probity in all their business transactions as any commercial body of men in the world; and it is not, therefore, to be thought for a moment that they sell these goods as being other than what they really are, or that the smallest advantage is taken by them of their direct native customers. What merchants naturally do in their own interests is to fill the orders they receive in the cheapest possible market, where the standard of goods required by them is best copied at a price which leaves them the best margin. So far from any British manufacturer having a right to blame them, if, finding they can sell German more profitably than English flannel, or other woollen piece goods, they give the preference to the former, the unwillingness that manufacturers have hitherto shown to adapt themselves to the peculiar conditions of the Japan market, has tended in no small degree to drive merchants to this course. In a conversation which I recently had with one of the most experienced English merchants in Japan, who is also one of the largest importers of woollen goods, he stated that, for twenty years and more, he had tried in vain to get attention given in the English manufacturing districts to fine "fancy goods," such as mousselines-de-laine and other goods of a similar class to flannels. He had put before some of the best makers samples and the fullest information, and it always resulted in labour lost. Two reasons appeared to contribute to this. One, that the workpeople were not adapted to the necessary delicacy of work; and the other, that the men holding an important position in the trade were averse to what they looked upon as "trifling" in business. They were not only quite willing, but eager to compete—and compete so as to entirely undersell their German rivals—for a long line of goods, which they and their fathers had made for generations past, and make to perfection now. They would bid very low for an order for 10,000 blankets, or for an equal quantity of Italian cloths, for which they had machinery capable of turning out enough for the consumption of the world. But they were not going to be "bothered" to alter their machinery for what was at best a doubtful article. "I was in a particularly good position some five or six years ago to know all about this; for, being at home myself, and having my partner here, and our firm being one of the largest importing houses of mousselines-de-laine, fancy woollens, and similar goods, I had the very best information to work upon; and our friends in Bradford, Manchester, and Leeds were the foremost in their class. But all we could get from them was a few sample pieces, accompanied with the answer that they could not work at the price. It is exactly the same with flannels. We are trying all we can to work this trade, and we do import some quantities of the goods, but we cannot get them at the price from England, and are eventually driven to Germany." While fully recognising that it is only reasonable and right that English merchants in Japan should go to those producing-centres which show the greatest readiness to meet and satisfy their demands, it is, at the same time, unfortunate that they should import the goods which they obtain from Germany, with English marks and chops on them, even though the latter are only intended to acquaint native dealers with the name of the firm supplying them, and not in any sense to designate the country of origin or production. Rightly or wrongly, English flannel has now a high reputation amongst Japanese consumers in Tokyo, while German has the reverse. What is the result, then, of importing the German with English marks on it? That means are placed in the hands of the Japanese middleman, or the ultimate retailer, which may aid him considerably in selling it as English; and if German is really so inferior to English flannel, as Japanese dealers and consumers in Tokyo allege it to be, a successful continuance of this practice may result in involving the latter, to some extent, in the bad name which the former undoubtedly has. Referring to the importation of low-priced shoddy cloths (average 1s. 7d. per yard), Mr. Longford remarks—Nothing could be more foreign to Japanese nature, as far as it is understood by those who have given most thought and study to it, than wearing clothing made of such stuff as this. Durability is the primary test of everything that is made in the country, and no taste originally existed among the people for the worst classes of "shoddy," no matter how cheaply purchased. Inferior cloth now, certainly, finds some sale, or it would not be so largely imported. It is used in Tokyo for school-boys' and students' clothing, but it principally finds its way into the country, where it is sold at large profits by the Japanese retailer to those who have not yet learned that appearance is not a safe test of quality. Whether, however, its import will pay in the long run is more than doubtful. Merchants must look to the present, and cannot afford to neglect immediate opportunities for the sake of an uncertain future profit; but just as bad quality, though attended with good appearance, has contributed to bring about a large decline in the import of English cotton piece goods, so there is reason to fear that the disrepute, which must ultimately attend this cotton mixture, may extend itself to all imported woollen cloths. These include alpacas, balzarine, bunting, camlets, camlet cords, China figures, lastings, long ells, lustres, Orleans, serges, Spanish stripes and others. The trade in Tokyo of woollen piece goods (cloth, flannel, &c.) in 1886

exceeded that of 1885 by at least 10 per cent., the primary cause of this increase being the great extension that has taken place in the use of foreign clothing in preference to Japanese. The most marked increase was in woollen cloth, in which it amounted to quite 20 per cent. Until recently, the prices at which good woollen cloth was saleable in Tokyo varied from 1 dol. 30c. to 1 dol. 50c. per yard; now as much as 2 dols. is freely paid. With regard to flannels, the average price which retail buyers paid last year was from 38c. to 45c. per yard; now from 45c. to 55c. is readily paid for English flannel of fair quality and tasteful appearance. The policy for all Japanese retail dealers in Tokyo in woollen goods is now to buy only those of good quality, and they will then be sure to do a profitable business, small it may be, but still profitable.

Mr. Consul Payton writes from Mogador (Morocco):—Great Britain holds her own in the trade in manufactured cottons so widely used for the clothing of the native population of all parts of the empire. Of the cloth coming from England, a good deal is of German origin, and I have already sent home samples of the kinds imported here, and at Casablanca (Daralbaida), with prices and other particulars; from which it appears that, though the quality of the goods is certainly not superior to that which our Leeds and Bradford manufacturers can supply, but rather the reverse, yet the Germans here, as elsewhere, are more pushing in the extension of their foreign trade, offering, even when they do not actually undersell us, the advantages of longer credits and easier terms of payment than British firms care to give; for the German merchants sometimes grant four months' credit without charging interest, and, as at Casablanca, allow payment to be made in local "pesetas," the seller of the German cloths taking the loss of exchange in remitting, amounting lately to about 4 per cent.

A foreign Consul says that, as exporters to Mexico, the English still head the list, but the competition on the part of Americans and Germans is steadily increasing every year. During the last three years, the American manufacturers have made considerable progress in prints, but less in white cotton goods, such as calicos and mantas; with the former they have driven the English manufacturers into the background. Berlin prints are too good for the consumption of the country, and, like the French, are now scarcely imported. In prints, moreover, the manufactures of the country are fast occupying the ground which they do in white goods. Scarcely any mixed goods are now imported since the duty on such is the same as for pure woollen. Considerable quantities of German goods are shipped indirect via France, and it is well known that German manufacturers often sell cheaper in Paris than they do in Germany. Berlin plaids of good quality are still exported to Mexico, though this article has suffered through the native manufacture. Fine barege, cheap black woollen stuffs (tibets), and cashmeres, are chiefly supplied by France. In furniture material, especially linen stuffs, the German manufacturers meet with great favour, and in hosiery, particularly children's, the Saxon manufacturers are masters of the field, the importation of American goods of this description having almost ceased. Mexico still presents a good field for European exporters, and it cannot be denied that the present Government have done much to develop the resources of the country.

The Canadian Customs Tariff.

It will be of interest and of use to many of our readers to keep before them the following extracts from the Canadian tariff revision and subsequent amendments, relating to textile trades and manufactures connected with them:—Canvas of hemp or flax and sail twine, for boats and ship sails, 5 p. c. Carpets and mats of hemp, 25 p. c. Cordage, all kinds, 1½ cts. per lb. and 10 p. c. Clothing of cotton or other material n. e. s., including corsets and similar articles made up by the seamstress or tailor, also tarpaulin, plain or coated with oil, paint, tar or other composition, and cotton bags made up by use of the needle n. e. s., 35 p. c. Collars of cotton or linen, 24 cts. per dozen and 30 p. c. Coloured fabrics, woven, of dyed or coloured cotton yarn, or jute and cotton, or other material except silk, n. e. s., 25 p. c. Bed comforters, or cotton bed quilts, not including woven quilts or counterpanes, 35 p. c. Grey or unbleached and bleached cottons, sheetings, drills, ducks, cotton or canton flannels, neither stained, painted nor printed, 1 ct. per square yard and 15 p. c. Cotton denims, tickings, gingham, plaids, cotton or canton flannels, ducks and drills dyed or coloured, checked and striped shirtings, cottonades, Kentucky jeans, pantaloons, and goods of like description, 25 cts. per square yard and 15 p. c. Jeans and couilles, when imported by corset makers for use in their factories, 25 p. c. Cotton sewing thread on spools, 25 p. c. Thread in hanks, black and bleached, 3 and 6 cord, 12½ p. c. Cotton wadding, batting, batts and warps, carpet warps, knitting yarn, hosiery and other cotton yarns under No. 40, not bleached, dyed nor coloured, 2 cts. per lb. and 15 p. c. If bleached, dyed or coloured, 3 cts. per lb. and 15 p. c. Ribbons, all kinds, 30 p. c. Rubber belting, rubber mats, etc., 5 cts., per lb. and 15 p. c. Sails for boats and ships; and tents and awnings, 25 p. c. Shawls, all kinds, except silk, 25 p. c. Shirts of cotton or linen, \$1 per dozen and 30 p. c. Silk in the gum or spun, not more advanced than singles, tramp and thrown organzine, not coloured, 15 p. c. Sewing silk and silk twist 35 p. c. Silk velvets and manufactures of silk, or of which silk is chief component part, n. e. s. (church vestments excepted),

30 p. c. Silk plush netting for glove manufacturers, 15 p. c. Socks and stockings of cotton, wool, worsted, the hair of the alpaca goat or like animal, 10 cts. per lb. and 30 p. c. Twine, all kinds, n. e. s., 25 p. c. Towels, all kinds, 25 p. c. Velveteens and cotton velvets, 20 p. c. Winceys, checked, striped or fancy cotton, over 25 inches wide, 2 cts. per square yard and 15 p. c. Winceys, all kinds, n. e. s., 22½ p. c. Manufactures composed wholly or in part of wool, worsted, the hair of the alpaca goat, or other like animal, viz.:—blankets and flannels, all kinds of cloths, doeskins, cassimeres, tweeds, coatings, overcoatings, felt cloths, n. e. s.; horse collar cloth; yarn, knitting yarn, fingering yarn, worsted yarn, knitted goods, viz.: shirts and drawers and hosiery, n. e. s., 7½ cts. per lb. and 20 p. c. All fabrics, wholly or partly of wool, worsted, the hair of the alpaca goat or other like animal—on such goods costing 10 cts. per yard, and under, 22½ p. c., costing over 10 and under 14 cts., 25 p. c.; costing 14 cts. and over, 27½ p. c. Clothing, ready made, and wearing apparel of every description, including cloth caps and horse clothing, shaped, composed wholly or in part of wool, worsted, the hair of the alpaca goat or other like animal, made up by the tailor, seamstress or manufacturer, not otherwise provided for, 10 cts. per lb., and 25 p. c. Carpets, viz.:—Brussels, tapestry, Dutch, Venetian and damask, carpet mats and rugs of all kinds, and printed felts and druggets, and all other carpets, n. e. s., 25 p. c. Treble ingrain, 3 ply and 2 ply carpets, wholly of wool, 10 cts. per square yard, and 20 p. c. Flax fibre, scutched, 1 ct. per lb. Flax fibre, hackled, 2 cts. per lb. Flax fibre tow, scutched or green, ½ ct. per lb. All manufactures of cotton, not elsewhere specified, 20 p. c. Crape of all kinds, 20 p. c. Damask of cotton, of linen, or cotton and linen, unbleached, bleached or coloured, 25 p. c. Excelsior for upholsterers' use, 20 p. c. Printed or dyed cotton fabrics, n. e. s., 32½ p. c. Cuffs of cotton or linen, 4 cts. per pair, and 30 p. c. Cotton warp, No. 60 and finer, 15 p. c. Cotton warp on beams, 1 ct. per yard, and 15 p. c. Handkerchiefs, cotton or linen, plain or printed, or printed in the piece, 25 p. c. Iron manufactures, n. e. s., 30 p. c. Leather, leather belting and upper leather, including kid, lamb, sheep and calf, tanned or dressed, but not coloured, waxed or glazed, 15 p. c. Jute carpets and mats, 25 p. c. Jute manufactures, n. e. s., 20 p. c. Laces, braids, fringes, tassels, embroideries and cords, 30 p. c. Machine card clothing, 30 p. c. Manilla hoods, 20 p. c. Lubricating oils, 25 p. c. Floor oil cloth, 5 cts. per square yard, and 20 p. c. Oil cloth in the piece, cut or shaped, oiled enamelled, stamped, painted or printed, India rubbered, flocked or coated, n. e. s., 5 cts. per square yard, and 15 p. c. Two ply and 3 ply ingrain carpets, with warp of cotton and other material not wool, 5 cts. per square yard, and 20 p. c. Felt pressed, of all kinds, not filled with or covered by any woven fabric, 17½ p. c. Wool, class 1, viz.:—Leicester, Cotswold, Lincolnshire, South Down, combing wools or wools known as lustre wools, and other like lustre wool, such as are grown in Canada, 3 cts. per lb.

FREE GOODS.—Aniline dyes, oils and salts, alum, sulphate of ammonia, apparel and personal or household effects of persons dying abroad or domiciled in Canada; arsenic, arseniate of aniline, dyestuffs and chemicals used in dyeing n. e. s.; bolting cloths not made up, bristles, canvas for the manufacture of floor oil cloth, not less than 45 inches wide and not pressed, jute canvas not less than 58 inches wide for manufacture of floor oil cloth, Caoutchouc, unmanufactured, celluloid or zylonite in sheets, donations of clothing for charitable purposes, coir and coir yarn, cotton waste and cotton wool, duck for rubber goods manufacturers, adhesive felt for sheathing vessels, Mexican fibre, vegetable fibre, fibrilla fillets of cotton and rubber for manufacturers of card clothing, hatters' plush, silk or cotton, hemp undressed, tampico fibre, jute butts, jute, jute cloth for bag manufacturers, jute yarn, plain or dyed, for carpet and rug manufacturers, manilla grass, rags for paper manufacturers, recovered rubber or substitute, silk, raw, as reeled from the worm, teasels, vegetable fibres, wool, unmanufactured, n. e. s., cotton yarns finer than No. 40, unbleached, bleached or dyed, for use in the manufacture of Italian cloths, cotton, worsted, or silk fabrics. Articles imported by, and for the use of, the Dominion Government, or any of the departments thereof, or by and for the Senate or House of Commons, and the following articles when imported by and for the use of the militia and army and navy, viz.:—Arms, military or naval clothing, musical instruments for bands, military stores and munitions of war.

A practical man, who has made boiler waters and incrustations a subject of careful study, declares that the high heats necessary to heat water through thick scale will sometimes actually convert the scale into a species of glass, by combining the sand mechanically separated with the alkaline salts. The same authority has carefully estimated the non-conducting properties of such boiler incrustations. On this point he remarks that the evil effects of the scale are due to the fact that it is relatively a non-conductor of heat. As compared with iron, its conducting power is one to thirty-seven and one-half, consequently, more fuel is required to heat water in an incrustated boiler than in the same boiler if clean. He also estimates that a scale one-sixteenth of an inch thick will require the extra expenditure of 15 per cent. more fuel; and this ratio increases as the scale grows thicker. Thus, when it is one-fourth of an inch thick, 60 per cent. more fuel is needed; one-half inch, 112 per cent. more fuel, and so on.

The Trade of the World.

[From Special Telegrams and Sources of News all over the World.]

TEXTILES IN SPAIN.

Our Madrid correspondent says that dress is an important factor in the domestic economy of Spaniards. As both sexes devote considerable attention to their attire, the consumption of textile goods is very large, but it is a trade of which, unfortunately, British houses get a very small share, comparatively speaking.

THE REASON FOR THIS.

Another foreign writer, speaking on this subject, says that cloth of various kinds is supplied by French, Belgian, and British houses, to a considerable extent, but owing to the critical times through which Spain has recently had to pass, and also to increased competition on the part of Spanish manufacturers, the French have lost ground materially during the past 10 years. Of late years, the manufacture of cloth has made great progress in Spain, especially in Alcoy and Catalonia, where all kinds of cloth are produced from combed or carded wool. The bulk of the ordinary cloth required by the working classes is of Spanish manufacture, France and England supplying novelties, and fine cloth for fashionable apparel. In woollen textiles, merino in various shades is the article most in request, black merino especially, all Spanish women possessing at least one black dress, this being the colour admissible on certain occasions.

THIS TRADE IN BLACK MERINO

Has become almost a monopoly of Spanish manufacturers. In the neighbourhood of Barcelona, there are numerous spinning and weaving mills which produce, not only textiles of pure wool but, mixtures of wool and cotton, and wool and silk, or the three materials combined. Some merinoes of fine French make still command a sale in Spain. The Germans also supply merinoes, but of greatly inferior quality to the French. The manufacture of cotton textiles has made great progress in Catalonia, where printed goods are produced like those manufactured in Mulhausen, of excellent quality, and at prices which defy all competition. Many of the managers of these works served their apprenticeship in Mulhausen, which accounts for the progress that has been made in this branch of industry. In cottonnettes, the Spanish manufacturers are not so successful, and large quantities of this class of goods, as also of madapolams, are imported from France.

LACE IN SPAIN.

As regards lace, it is well-known that the mantilla forms an essential feature in a Spanish lady's dress. The real Spanish mantilla is of Catalonian manufacture, and is made in black and white of various sizes and shapes, the prices ranging high. The poorer classes cannot afford to buy a real mantilla, and, therefore, it can be easily understood that good imitations meet with a ready sale. Shawls are largely worn by females belonging to the lower classes, especially those made of printed wool and French cashmeres. The finest qualities come from France, the imitations from Germany. There are two sizes principally in use.

FANCY GOODS AND HOSIERY IN SPAIN.

With regard to table linen in Spain, it may be said that the French and Belgian manufacturers have the Madrid market to themselves. An article much in vogue is fancy pocket handkerchiefs. France, Germany, and Great Britain compete for this business, and it may be remarked that the goods find a readier sale when put up in handsome boxes decorated with red and gold. The demand for hosiery of all kinds in Madrid is very considerable, the commoner articles—or rather those for which there is the greatest demand—being imported from France. Thread and cotton stockings manufactured in Nîmes, socks and neckerchiefs of German make, are in most general request. As regards kid gloves, those made by Geley and Co., of Seville, and also at Valladolid, leave nothing to be desired in the way of manufacture; but the production is limited and insufficient to meet the demand, so that the sale of French gloves is still considerable in Madrid.

COTTON GOODS IN CUBA.

This is from a French writer naturally interested in French goods:—"Cotton tissues imported into Cuba arrive here in great quantities, but they seldom come from France. They are supplied by England and Germany, as well as by Spain and the United States. The tariff favours goods of Spanish origin. As a rule, they consist of tickings for mattresses, pillow cases, and hangings. French goods could compete with these, not only as to quality but, as to design. Cuban importers tell me with one accord that, if French manufacturers studied the tastes of the country, they could place annually large quantities of their goods. Dressing is an important question: cotton goods imported here require a special dressing. They are soft, flexible to the hand, and they feel like cloth. Then again there is the question of width. A width of from 64 to 65 centimetres will not do here. Another important point is that English, German, and American manufacturers have agents here to whom they send samples. These agents call upon importers and offer them special terms which could not be done by importers at a distance. These observations apply, not only to cotton goods but, also to cloth and silk goods."

A NEW COMMERCIAL MUSEUM.

We learn that a commercial museum is to be created at Pnom-Penh in Cambodia, of which M. Gueydon, who is said to be well acquainted with the country, has been named conservator. The establishment of the museum is said to be due to the initiative of M. Piquet, resident-general in Cambodia.

THE FLOATING EXHIBITION.

The project of a floating exhibition of Italian products continues to obtain numerous supporters, and amongst these are 375 manufacturers and producers of the first importance in Italy. Also 55 Chambers of Commerce of the Kingdom; 9 Italian Chambers of Commerce abroad; 14 agricultural committees; 5 Societies and associations for developing the national industry; 15 Italian consuls, residing in the countries to be visited, have promised their moral support.

THE JUTE INDUSTRY IN GERMANY.

A correspondent says that the manufacture of jute was introduced into Germany by a Brunswick company in 1861; nevertheless, it is only of late that it has attained much importance, and this, to a great extent, owing to the recent policy of the German Government as to its tariffs. It is said that the German products are in no way inferior to the Scotch manufactures. They find a ready sale in the interior of Germany, and in 1886, 51,400 kilos. of jute and manilla textiles were exported from Germany. The German jute factories do not only supply packing cloth, but bags, sailcloth, cordage, carpets, ticking, &c. Latterly, indeed, attention has been given to a textile known as "jute velvet," which serves for upholstering and other purposes. The jute industry of Germany represents at the present time nearly 70,000 spindles, which can produce annually at least 600,000 double quintals of goods. An idea may be formed of the growth of this branch of industry in Germany by the quantity of raw jute imported, which, in 1880, amounted to 175,644 double quintals, and in 1886 to 440,019.

COMMERCIAL TRAVELLERS' SAMPLES.

In Austro-Hungary the Minister of Finance has issued an ordinance under which, subject to certain protective regulations, English commercial travellers' samples or models will be allowed free entry into that country. The customs office of the port, or place where the models or samples enter, will fix the amount of duty to be met, which sum must be deposited in money by the traveller with the customs office, or guaranteed by a security. For the purpose of determining the identity of objects, each model will be, as far as possible, indicated as free of duty by the affixing of stamps or seals. The papers required to pass such goods will be (a) A list of the objects with the necessary particulars to enable them to be identified; (b) The total of import duties paid, indicating whether the payment was made in ready money or met by the deposit of a security; (c) An indication of the kind of mark used to show exemption from duties; (d) The fixing of a period within which the models or samples will be re-exported or entered in a bonded warehouse, after the expiration of which period the amount deposited will be forfeited if the stipulation is not complied with. Re-exportation should take place by another customs office than that by which the goods entered. If, before the termination of the period fixed within which the goods may be re-exported or bonded, application is made to the customs, the customs officer will, after satisfying himself of the identity of the objects, certify for exportation or deposit, and return the money paid in, or take the necessary measures for obtaining the return of the security.

The Technical Instruction Bill.

According to the text of this bill, the power of establishing, or extending, technical education, is to be centred in school boards, or in councils, in boroughs where there is no school board. In districts which are outside boroughs, and have no school boards, no provision is made for the establishment of such education. The first step to be taken to provide further technical instruction is for a "Local Authority" to pass a resolution "That it is necessary to supplement, by technical instruction, the elementary education of a district," and for that purpose to put in force the provisions of the bill. The ratepayers are protected by the provision that any fifty persons entitled to vote at the election of local authorities, or one-third of that number, may demand a poll to be taken as to the desirability of carrying the resolution into practice. This poll must be by ballot, the voters being those who have a right to vote at the election of the school board or of the town council—as the case may be—each person having only one vote. If the resolution be not carried, it cannot be proposed again until the expiration of a year; if it be carried, the powers of the local authority are:—(1) To provide technical schools for its district; or (2) to combine with any other local authority for the purpose of providing technical schools common to the districts of both authorities; or (3) to contribute towards the maintenance, or to the provision and maintenance, of any technical school; or (4) to make such

arrangements as may seem expedient to it for supplementing by technical instruction the instruction given in any public elementary school in its district. The working out of these provisions is left almost entirely in the power of the Science and Art Department. The "Bill" defines "Technical Instruction" to be instruction in the branches of science and art, with respect to which grants are, for the time being, made by that department, or in any other subject which may, for the time being, be sanctioned by that department; and a "Technical School" includes, not only a school but also, a department of a school, which is giving technical instruction to the satisfaction of the Science and Art Department. When a technical school has been once established, it may not be discontinued unless the authorities can satisfy the Department that it has become unnecessary. The expenses incurred by local authorities in respect of these schools are to be defrayed out of local rates, but no payment is to be made out of such rate for a scholar until he has passed the sixth standard, or some examination equal to this standard.

Alterations in the Tariffs of Austria and Russia.

The Secretary of the Manchester Chamber of Commerce (Mr. J. Fox Turner), in reply to inquiries made by him as to recent changes in the tariffs of Austria and Russia, has received from the Board of Trade the following table, showing the rates of duty now leviable in Austro-Hungary upon the importation of cotton yarns from the United Kingdom, compared with the rates levied under the previous Austrian tariff:—

Tariff number.	Classification of goods.	Tariff rates of duty.	
		Old tariff. Fl. Kr.	New tariff. Fl. Kr.
	Cotton yarns.	Per 100 kilos.	Per 100 kilos.
124..	Single raw:—		
	a to No. 12 English	6'00	.. 6'00
	b over No. 12 to 29 English.....	8'00	.. 8'00
	c ,, 29 to 50 English.....	12'00	.. 14'00
	d ,, 50 English.....	16'00	.. 16'00
124 bis..	Doubled raw:—		
	a to No. 12 English	6'00	.. 8'00
	b over No. 12 to 29 English.....	8'00	.. 10'00
	c ,, 29 to 60 English.....	12'00	.. 16'00
	d ,, 60 English	16'00	.. 12'00
125..	Single or double bleached or dyed:—		
	a to No. 12 English	10'00	.. 12'00
	b over No. 12 to 29 English.....	12'00	.. 14'00
	c ,, 29 to 50 English.....	16'00	.. 18'00
	d ,, 50 English	20'00	.. 20'00
126..	With 3 or more threads, twisted, raw, bleached, or dyed	24'00	.. 24'00
127..	Yarns prepared for the retail trade, weavers' heddles made out of twisted yarn	30'00	.. 35'00

Respecting Russia, the Board of Trade reply that the only alteration which has been made in the tariff on cotton yarns, since the date of the issue of the return relating to foreign and colonial import duties, is in regard to "sewing and knitting threads of all kinds." The duty under this head is now fixed at the rate of six roubles gold per pood, gross weight, the previous duty having been six roubles per pood, net weight, with an allowance for tare of from 20 to 35 per cent. according to the nature of reels, packing, &c.

Text Books of Ornamental Design.

THE ANATOMY OF PATTERN.—BY LEWIS F. DAY.

London: B. T. Batsford, 52, High Holborn, W.C.

This work, the first of a series, will be found of much value to the student in design, to whatever branch of manufacture his efforts may be devoted. The author has entered into his work with spirit, the result being a set of interesting and instructive chapters on the anatomy of pattern in all its bearings. He deals with pattern dissection, and pattern planning; the drop pattern, skeleton plans and appropriate pattern. In order to render the work as complete as possible, no fewer than thirty-five plates are given, which suitably illustrate, and readily explain, the author's words. It is an entertaining work, well worthy the attention of all interested in designing, and is a welcome addition to the books already published on the subject. One feature in its favour is the neat, and yet inexpensive, manner in which it has been published, bringing it within the reach of all.

The manufacture of carpets from pine wood is likely to become a permanent industry. The fibre is first dried, then put through a cleaner, when all impurities are removed; after being carded, it comes from the machine in slivers about three inches wide. The following processes are much the same as in the manufacture of other carpets. The natural colour of the pine straw is a rich dark brown, when bleached, it becomes a creamy yellow. When the yarn is required for the manufacture of carpets of other colours, it is dyed as necessary.

ODDS AND ENDS.

The new Portuguese Tariff affords a pretty complete idea of the views held by the Government on this subject. In many instances there is an increase proposed in the duties. Raw wool, which now enters free, will pay an import duty of 35 reis per kilo., and as regards manufactured woollen goods, the Portuguese manufacturer will be protected by a duty of 34 per cent. There is an increase, too, in the duties on silk, cotton, flax, and hemp, and the goods manufactured from these materials. As regards goods re-exported or in transit, they will be exempt from the duty to which they were subject hitherto.

Marseilles calls attention to an invention spoken of in Italy, which the promoters claim will revolutionise the fine "tissues" market, *i.e.*, the substitution of mulberry fibre for cotton. It is said that, on lifting the bark of the young shoots of mulberry trees, a fibre is found which, in fineness and tenacity, is not exceeded by silk, and it remained for an invention to be made for treating the bark and isolating the fibre by a mechanical process. After studies prosecuted at Brescia, two students—the one English, the other Piedmontese—are said to have found a solution, and under their process to produce a very fine fibre, bearing comparison with flax and nearly approaching silk. The name given to the new material is *gelso lino*, and English houses are already said to have made offers to buy all the available production.



PATENTS.

Applications for Letters Patent.

Automatic silk reeling machine. E. W. Serrell, Paris.	30th June	9,273
A swift for silk or cotton winding. C. and J. Higginbotham, Macclesfield.	30th June	9,275
Apparatus for dividing fibres applicable to carding engines. J. E. Renshaw and J. Schofield, Rochdale.	1st July	9,329
Bobbins. J. H. Wilson, Manchester.	29th June	9,223
Block printing machines for textiles, &c. J. C. Cook, London.	4th July	9,455
Battering or raising pile of pile fabrics. H. Lister, Halifax.	7th July	9,569
Brussels carpets and other jacquard bordered carpets woven in breadths. H. Fawcett, London.	18th July	10,062
Connecting ends of driving belts. T. Browne, London.	30th June	9,306
Cutting pile fabrics (apparatus). G. Roger, Manchester.	2nd July	9,395
Calico printing machines. R. Hamilton and T. McKillop, Glasgow.	6th July	9,538
Cotton cloth for special purposes. J. Hothersall, Manchester.	9th July	9,659
Cleaning and bleaching cotton, &c. W. P. Thompson, Liverpool.	12th July	9,722
Checking the shuttle and picker in looms. T. Burns and T. Blades, Bradford.	21st July	10,187
Damping, gumming, varnishing, and spreading liquid on textiles, &c. J. Allen, Halifax.	6th July	9,536
Dyeing skeins. C. Meadowcroft and P. Denanhouer, London.	12th July	9,720
Doffing or stripping fibres from rotary surfaces and removing burrs, &c., from the fibre of carding engines. J. and T. Scott, Halifax.	12th July	9,765
Drawing off fibres in combing machinery. J. Holden, London.	16th July	9,989
Drop box loom. W. H. Hacking, Manchester.	27th July	10,432
Fustian-cutting knives. R. Collinge, Manchester.	9th July	9,672
Friction driving and starting gear. T. Schofield and F. Barker, Cornbrook.	14th July	9,883
Figured fabric. A. Bonnem, London.	20th July	10,143
Felt. A. Davidson, London.	20th July	10,173
Feeding wool, &c., to carding engines, and cleaning, dressing and removing burrs, &c., from fibres. E. Wilkinson, Halifax.	27th July	10,428
Gig mills. W. E. Heys, Manchester.	19th July	10,076
Gas and vapour engines. C. Ridealgh and C. J. Fairman, Newcastle.	26th July	10,384
Jacquard machines. J. and T. Wilkinson, Bradford.	15th July	9,916
Lessening, or taking out, or preventing snarls. W. Taylor, Oldham.	28th June	9,136
Looms. H. H. Lake, London.	28th June	9,179
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Polishing yarn and apparatus. E. Caspar, London.	1st July	9,350
Pickers. E. Barraclough, Rochdale.	2nd July	9,383
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Patents Sealed.

8,855	10,136	11,975	15,677	441	8,315	8,364	8,416
8,449	8,661	238	3,525	4,360	4,365	5,759	8,593
12,887	1,253	16,780	2,868	4,726	4,755	4,764	4,945
7,470	7,646	8,766	8,816	8,914	9,106	9,932	5,156
7,470	7,646	8,766	8,816	8,914	9,106	9,932	2,830
5,156	6,932	8,913	10,365	9,010	443	6,573	8,619
9,181	9,286	9,855	10,737	10,828	14,956	4,613	5,256
5,522	7,447	8,407	9,337	9,338	9,363	9,429	5,618
5,686	5,706						

The Journal of Fabrics

AND

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Notices.

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The British Association.

The British Association have been holding a most successful congress in Manchester during the last few days, and many papers have been read which are of interest to textile manufacturers. We are enabled to give short extracts from the principal ones :—

CALICO PRINTING.

Mr. Charles O'Neill (Manchester) read a paper on "The extent to which calico printing and the tinctorial arts have been affected by the introduction of modern colours." He remarked that the first of the modern colours was Mr. Perkin's aniline mauve, which was discovered and applied in the year 1856. In April, 1859, the next modern colour—majenta—or fuschia, made its appearance. The tide rose slowly in 1860 with purples, blues, and violets, and gained every year in force and volume, until the flood had now risen to such a height that one who would keep up with it stood astonished at its extent, and well-nigh confounded by the prospect before him. Nor was there any sign that we had got to the high-water mark, for, month after month, chemists and colour manufacturers were patenting colours, or new processes, in such numbers that only specialists of specialists could pretend to follow or to appreciate the work that was being done. In the course of an interesting review of the progress which had been made in the invention of printing

colours of late years, Mr. O'Neill said that in 1856 the two most important colouring matters were indigo and madder. Neither of those colours could be directly printed on calico. Indigo in the form of China blue was printed on it, to be subsequently fixed by a process analogous to dyeing, but it was not an important branch of the indigo styles. All attempts to obtain an extract of madder fit for printing had failed, and it was not until about ten years afterwards that an extract of madder came into the market, and for the first time the printer was enabled to produce, by direct application upon the cloth, various colours yielded by madder. The madder styles of 1856 were of great excellence, and, as produced by the best houses, quite as good, or better, than pure alizarine styles were now, in that alizarine could not be made to yield as good work as madder did. The present conditions of the trade with regard to price, however, were unfavourable to the highest excellence in that class of prints. He pointed out that, if artificial alizarine had not come up, there could not have been the extensive productions of many fast coloured cretonne styles which had been the characteristic of the trade for several years past. The introduction of these most important and valuable of the modern colours had had the effect of cheapening the price of the best kinds of calico prints. By best, he meant those of the most durable colours used for personal wear, and, so far, it was a boon to the purchaser; but how far it had benefitted the calico printers was another question. It would appear that the greater facility of producing possible colours had greatly increased the production. The same works and machinery could, with these and other modern colours, turn out from 50 to 70 per cent. more printed calico than could have been done in the old madder-dyeing days. Increased production, without a corresponding increase in demand had, of course, led to a gradual lowering of prices, until profits were cut down to a very low margin. He thought it might be held that the colour mixing, made easy by the introduction of modern colours, had much to do with the unremunerative condition of calico printing. Comparing work done 34 years ago with that which was produced now, he thought there had been no great change in results as far as regarded the quality of the work. There had been a lessening of the cost of colour, and a lessening of the labour of the colour mixer, and, undoubtedly, some colours now were brighter than then, but there was not much in that. As to fastness of colour, except as regarded reds, there had been no gain, perhaps even a loss. None of the modern colours, except alizarine, and its allied blue and orange derivatives, could be said to be fast colours upon cotton in the sense that madder or indigo were fast, but, at the same time, many of them were fast enough for the purposes to which they were applied. The idea that all new dyes were bad dyes, and that, in the old times, there were no loose colours, was not warrantable. The truth was that with the ancient dyes, as with the modern dyes, there was plenty of loose bad dyeing. If the wholesale condemnation of modern colours were correct, those dyes must have fallen into disuse long ago. Whatever might be the true state of the case with regard to cotton, he considered that the introduction of modern colours in the dyeing of fancy silk and woollen styles had been a great advantage.

LIMITED LIABILITY.

A paper on the subject of limited liability was read by Mr. G. A. Jamieson, of Edinburgh, who was a member of the Royal Commission on Trade. He enumerated a number of alterations which he regarded as essential, and some of the evils which required correction, in our present system of limited liability. He offered the following suggestions for the improvement of the system :—I. As to the inception of the company.—1. That it shall be provisionally registered before issuing its prospectus, and a deposit of, say, 5 per cent. on the capital made shall be returned on complete registration. 2. That the application for provisional registration shall set forth the full names and designations of the promoters, directors, and officials, and shall be accompanied by written evidence that all the directors and officials have agreed to accept office. 3. That, in addition to existing stipulations, it shall be provided that the prospectus shall set forth the proportion of the capital of the company which is required to be subscribed before the company can commence business. 4. That complete registration shall be effected only after a certificate has been lodged with the registrar, signed by the promoters, and all the directors

and officials, that the minimum amount of capital has been subscribed, and the deposit on application, being not less than 5 per cent. on the amount subscribed, has been paid. II. As to the administration of the company.—1. That the memorandum of association should be made so far flexible as to be capable of alterations by a vote of the great majority of the members, subject to the sanction of the court. 2. That no company shall have power to borrow on debenture, or to accept money on deposit, or to grant any obligation for money, except in the ordinary course of business, to a greater amount than one half of the capital at the time subscribed, or to an amount exceeding the sum at the time paid up of its share capital. 3. That, in all companies of which the capital is not fully paid up, the profits available for division among the shareholders shall be applied, in the first place, in or towards paying interest at a rate not exceeding 5 per cent. on the capital at the time paid up, and thereafter in payment of a dividend on each share, irrespective of the amount paid up thereon. 4. That companies may repay by lot, or otherwise, the subscribed capital, and may thereupon issue certificates entitling the holders of shares so paid off to draw dividends along with the remaining shares, after interest has been paid on the remaining capital. III. As to the winding up of companies.—1. That there shall be attached to every share a reserve liability, exigible only on liquidation, of from 10 to 30 per cent. of the nominal amount of the shares. 2. That no liability for uncalled capital, other than the reserve liability, do attach to a holder of a share after he has sold the same. 3. That responsibility for the reserve liability do attach to every holder of a share who may have held the same within twelve months prior to the date of liquidation. 4. That it be competent on the motion of any creditor or creditors holding debts of a specified amount, or proportion, of the capital, whose debts are not fully paid six months after the date of liquidation, to apply to the court for an order on the liquidator to levy so much of the reserve liability as may be required to provide full payment of all debts and expenses; and if to the court it shall seem right so to do, in order to provide for the immediate payment of the debts, directions shall be given to the liquidator accordingly, and he shall levy the reserve liability from all persons liable therefor to the amount required; and the rights and equalities of the parties liable to such levy shall be adjusted *inter se* in the liquidation.

ALKALI MANUFACTURE.

Mr. Alfred E. Fletcher (Her Majesty's Chief Inspector under Alkali, &c., Works Regulation Bill), read a paper on "The present position of the alkali manufacture." He said it was fitting that a review of the changes which were taking place in the manufacture should be made in this year, which, besides being the jubilee year of the Queen's reign, was the centenary year of the Leblanc process. Leblanc's process had withstood the attacks of all rivals, and, although now its supremacy was more fiercely attacked than at any previous period, he thought he should be able to show that its foundations were still secure, and that it would maintain its position for many a year to come. During the last ten years, slight alterations had been proposed in the proportions to be used of the three ingredients forming the charge of the black ash furnace—the coal, brimstone, or chalk, and sulphate of soda—and in the method of throwing them in the furnace. The main process, however, of fusing those materials together, and, when cold, lixiviating the mixture for the extraction of carbonate of soda, is followed almost exactly as was proposed by Leblanc, now just a century ago. Having sketched the growth and progress of the soda manufacture as carried on by the Leblanc process, pointing out that until the year 1877, all the soda of commerce was made by that means, he said that, in 1877, the now well-known ammonia soda process forced itself into notice, and had since then reached such large proportions that 17·4 per cent. of the soda now manufactured in this country was produced by that method. In Germany, the amount of soda made by the ammonia soda process was 75 per cent. of the whole; in France, it was 60 per cent., and in Austria, 47 per cent. There were in Germany 24 alkali works, from which the yearly output was a quantity equivalent to 150,000 tons pure carbonate. This was against an output in 1878 of 42,000 tons. It must now be acknowledged that the famous process of Leblanc, as hitherto practised, was seriously attacked

by another as far as the manufacture of carbonate of soda was concerned, and it would have been by this time completely driven out of the market by its rival, but for the importance of its by-product. Bleaching powder had as yet not been made in connection with the ammonia process. Three methods were, however, proposed, and were on their trial for the attainment of that end. Mr. Solvay, a Belgian engineer, proposed to boil down the waste calcic chloride liquor of the ammonia process to dryness, and furnace the residue with clay. Mr. Mond heated his residual ammonium chloride with oxyde of nickel, distilling off ammonia with the formation of nickel, which was subsequently heated in a current of air with formation of chlorine. The third process was that of Mr. Pechiney, who obtained a residual of chloride of magnesium, from which, on application of heat, and steam, the chloride was recovered. The result of this threefold attack on the principal remaining prop of the Leblanc process was watched with the greatest interest. If bleaching powder could be produced by either of them at moderate cost, the role of the older alkali process was played out. As things now stood, a further fall in the price of soda ash would not harm the Leblanc manufacturers, since they could advance the price of bleaching powder in sufficient measure to recoup themselves. But if any manufacturer should develop a process whereby more bleaching powder could be made per ton of salt decomposed than was at present done, he would have an immediate advantage. Should all adopt such a process, things would re-establish themselves as at present as far as profit went, but the Leblanc makers would produce less ash, and those using the ammonia process would produce proportionately more. The real struggle would arise when bleaching powder was cheaply made in connection with the ammonia process. To whom the final victory would be awarded, who should say? They might, however, fairly say of the Leblanc process, his roots still stood firm in this, his adopted country, and when the lethargy bred by long unrivalled success should have been wholly dissipated, a fresh victory over his opponent might still await him.

THE TRADE RESOURCES OF THE SOUDAN.

Major Watson, R.E. (who was Acting-Sirdar of the Egyptian army, and afterwards Governor-General of the Red Sea Littoral), gave an interesting account of the trade resources of the Soudan, where, he said, they had a country of vast extent, of considerable fertility, and a population of millions, reduced to a most miserable condition by the wars of the last four years. After further remarks upon the disastrous effects of wars, Major Watson said:—Perhaps the best way to re-open trade with the Soudanese would be for a company to be formed to take charge of the coast on behalf of the Egyptian Government, which would hand over the Customs and duties to the company. The English Government, which now paid for the garrison of Suakin, might contribute a fixed sum to the company, on the distinct understanding that they incurred no responsibility beyond keeping two or three gunboats to watch the slave trade. It would be easy for the agents of the company to get into communication with the tribes along the coast, and if small posts were established at the different harbours, trade would soon commence. This subject was further dealt with in a paper on the Red Sea trade, contributed by Mr. A. B. Wylde, an English trader in the Soudan, the President (in the writer's absence) reading it. Mr. Wylde described the numerous advantages which would follow the adoption of the Suakin-Berber route to the Soudan. The development of trade depended to a great extent on the construction of a railway from Suakin, and the use of steamboats on the Nile; but he suggested that they should at once proceed to get back trade, using camels across the desert until other means of transit could be provided. The merchants of England should combine to get the trade opened, and deal with the natives direct. The Soudan question should not be allowed to drift. It could be settled at once, and the country would cease to be a source of annoyance, and become another outlet of trade. Colonel Sir Charles Wilson, R.E., opening the discussion, said the great peculiarity of the Soudan was that, between the Nile and the sea, they had the enormous block of the Abyssinian table-land. No trade could get out of the Soudan from the Nile valley but over the great Abyssinian table-land. The whole of the trade from that portion of Central Africa must come out in

the vicinity of Suakin. The limit of the trade which would come out there, it was difficult to foretell, because it depended a great deal upon the way in which the navigation of the swamp country was managed. Mombasa and Suakin were the only two outlets for the whole of Central Africa. The proper way to work the trade of the Soudan, as the English Government would not take it up, would be for a Company to be started, and to take over that portion of the coast. He thought the trade that would spring up would yield good returns, and there would not be those difficulties which some people supposed. Major Watson considered that, if England allowed any foreign country to take the trade of that enormous territory, it would be a disgrace to them. The President, replying to a question, believed some of the plant of the railway that should have been constructed between Suakin and Berber was now at one of the arsenals; but he was under the impression that it was not thought suitable for the purpose.—Sir Charles Warren also said the experience of everybody who had been in the country was that neither the Egyptian nor the Turkish Government could ever successfully govern the Soudan, or make it prosperous.

Consular Reports.

SERVIA.—With reference to the cotton trade of Belgrade, Mr. Wyndham writes:—In 1886, this country imported from England the following:—

	Quantity. Centners.	Value. £
Cotton yarns	5,829 ...	58,713
„ stuffs (for clothes)	3,000 ...	44,000
Sewn sacks	603 ...	2,400
Fine linen from flax	94 ...	1,080

All these goods are imported by the Servian merchant through agents, and not direct from the manufacturers themselves. Cotton yarns sell well in Belgrade, especially T cloths (24 yards), shirtings for lining purposes, prints (calicoes) and domestics. In spite of Austria's competition, most of these articles of English make are still preferred; this is especially the case with English shirtings, which the leading merchants in Belgrade inform me are much preferred to the best made Austrian ware. Bleached mule, however, is beginning to be imported from Austria to the detriment of English make. Mr. Jovanovich, who is the leading merchant established here, dealing with Manchester goods, tells me that he sees no reason why this trade, which, as a rule, is an extremely profitable one in Belgrade, should not extend itself. There is unquestionably a large demand for English-made goods in general; and the few merchants in Servia dealing in English articles have no reason to be dissatisfied with the profits gained. Hitherto, Austrian goods have had it all their own way, but most of the Servians I have met state that they are so pleased with the superior and lasting qualities of British goods in general that they would willingly pay a little more to obtain such articles in preference to the very inferior Austrian and German goods which flood the market. Yarns are chiefly sold in the month of February and March; manufactured goods in April and May. About three-fourths are unbleached, and one-fourth bleached. Most of these goods are sent to Fiume from Liverpool through the Adria-Hungarian Steamship Co., and from Fiume direct by rail to Belgrade; this is considered the cheapest route. Woollen goods valued at £2,791, silks and silken fabrics at £200, and ready-made clothes at £5,458, were imported in the year 1886, besides metals, leather, raw hides, &c. It should not be forgotten that an indirect trade is likewise carried on in English products through German and Austrian firms; the value of which, at a rough calculation, may be estimated as about equal, if not more, to the direct imports.

SALERNO.—Consul Hartwell states that cotton yarns, domestics, prints, shirtings, &c., are produced in the consular district of which Salerno is the centre, and that these, with prints from Austria, Germany, and France, and woollens from Germany and Belgium, supplant goods of the same description imported from Great Britain, the cause being a greater suitability in point of taste, and a cheaper article. Importations from England would, no doubt, be increased by studying closely the tastes and wants of consumers, new descriptions of goods being exhibited by intelligent and well educated commercial travellers having a good knowledge of the Italian language. Samples and patterns for spring should be sent in the months of October and November, those for winter in February and March; Manchester cotton yarns, grey shirtings, bleached shirtings, madapollams, Victoria prints, furniture prints, a few velvets, woollen coatings, pilots, &c., from Leeds and Huddersfield, and Bradford dress stuffs, are, it would seem, chiefly demanded. The German traders have at present obtained a great hold upon the trade in this country by closely studying the wants and tastes of the people, whereas English manufacturers are fast losing Italian trade by their own fault. They do not supply articles that are most wanted, and their travellers, as a rule, know no other than their own language. Piece goods should be priced

by the metre and in francs, instead of yards and shillings; again, English manufacturers and their agents should be prepared to take small orders. Our manufacturers should also follow the French and German in quality, finish, and harmony of colour.

MEXICO—VERA CRUZ.—Consul Baker writes:—Notwithstanding the enormous degree of protection enjoyed by the home cotton factories, they are not able to compete successfully with all classes of English goods, and England imports at Vera Cruz cotton goods to the value of nearly £250,000 sterling, leaving but a small proportion of this trade to France, America, and Germany. America's share would be even smaller, but for the advantage she possesses in being close at hand. American manufacturers send bundles of samples here, each numbered and marked with a code word, by means of which customers can send their orders by telegraph, which orders are executed by next steamer, so that the goods are often in Vera Cruz a fortnight after the despatch of the order. This is a great advantage, especially as regards prints and other goods ruled more or less by fashion, and disposes the customers to give a higher price in consideration of the saving in time and of avoiding the risk of fashions changing before the goods can be sold retail. If British houses had export agents here, they might imitate this prompt way of doing business, though the greater distance must, of course, always be more or less an obstacle, though not so great as appears at first sight, as the American manufacturers get their principal patterns from England.

TRIPOLI—BENGAZI.—Consul Wood writes:—Whilst exportation has diminished, the import trade, in which English cotton goods, as usual, continue to be the chief article, has kept its footing, more, however, on account of the engagements already existing between importers and foreign firms than of the demand. The supply thus exceeding the requirements of the population, the capital of importers remains dormant on their hands, until they are obliged, in order to keep their engagements and maintain their credit, to sell at a loss. Competition at this pass has, as usual in these parts, engendered a fraud which is carried on in the following manner:—Pieces of "mahmoudi" and other stuffs are imported by the unscrupulous, bearing in large characters the number of yards which they ought to contain. The native purchaser, as a rule, does not measure the stuff he buys, being content, as he has been from time immemorial, to count the folds, which, however many yards may be missing in the piece, are still the same in number. His ignorance, good faith, and strong attachment to ancient customs are thus taken advantage of to his detriment. To such an extent have these nefarious proceedings reached, that the local authorities have decided to prohibit the entry of all pieces of cotton stuffs which shall be found on measurement to contain less than the number of yards or metres inscribed upon them.

Consul Newman, of Valparaiso, reporting to Lord Salisbury on the native woollen manufactures in Chili, forwards two packets containing samples of the various woollen cloths produced in the factories of Santiago and Tomé, with particulars of the packets forwarded, which are specimens of the textiles required for native use. These specimens have been handed over to the Dewsbury Chamber of Commerce for inspection by those interested. Packet No. 1:—Samples of cloth manufactured at Santiago, length from 25 to 30 mètres each piece; breadth, from 1·30 to 1·40 mètres; price, \$3 (say 6s.) per metre, 6 per cent. discount. Quantity used per annum, from 80,000 to 100,000 mètres, divided as follows:—

	Mètres.
Ladies' shawls	20,000
Gentlemen's shawls	3,000
Blankets, fine quality	2,200
„ fair quality	8,800
„ ordinary quality	16,000
Tweeds, assorted	30,000
Military and horse cloths, ponchos, table-cloths and curtains, &c.	30,000

Packet No. 2:—Samples of cloth manufactured at Tomé, length, 25 mètres; breadth, 1·40 mètres; price, average \$3 per metre, 6 per cent. discount. Tweeds, &c., quantity used per annum, 100,000 mètres. Blankets, various qualities, from 600 to 1,000 annually; length, each blanket, 2 mètres; breadth 1·60 mètres; price, \$4 to \$10 each. Ponchos, various qualities, 1,000 annually, price \$6 to \$12 each. The principal consumption is in Chili; only comparatively small quantities are exported to Peru and Bolivia. A special duty has been placed on similar goods to those imported, and British manufacturers, in calculating the cost of placing such articles on the Chilean market, must be careful to take that import duty into consideration. The import duty leviable upon such classes of goods is as follows:—Cloths from 60 to 75 centimètres in breadth, pay 36½ cents., paper currency, per metre; from 57 to 150 centimètres in breadth, pay 72½ cents. per metre. Blankets of ordinary and fair quality pay 62½ cents. per kilogramme; and those of fine quality pay 99 cents. per kilogramme. Although the samples themselves are a sufficient indication, I may, however, add that the tastes and requirements of the natives are very similar to those of the poorer classes in England, with the exception of "poncho" and hat, which, for the lowest classes, are manufactured in this country. A cotton cloth, called here "cottonade," is also largely used; this is an imitation of woollen suitings manufactured in Yorkshire, and is principally imported from Germany, but which, I am informed, is now being successfully imitated in England. The

articles in which the Germans excel are cottonades, ponchos, braid, flannels, buttons, and nearly all smallwares; woollen goods of various classes—more than 60 per cent. of the consumption of the country coming from Germany—fancy blankets, fingering wools, parasols, &c. The price at which these articles are sold varies according to the exchange and the position of the market. In prints, the English are preferred. It may, perhaps, be advisable to add, for the guidance of manufacturers at home, that merchants here generally complain that English manufacturers do not study the changes in the requirements of the market in the same manner as their continental competitors; and the consequence is that, whilst articles of regular consumption, which seldom change in character, are imported chiefly from England, articles which require manipulation to prepare—as well as good taste—and which constantly change in design, or make, are imported principally by continental houses. As this market requires constant change in the character of its merchandise, it has given the continental houses the opportunity of competing successfully with the English goods.

TRADE WITH FRANCE.—Mr. Consul Pauncefote, of Nantes, says that it is generally admitted that commercial travellers are the best means whereby to give an impetus to British trade, but their absence from his district is probably due to the fact that British manufacturers are disinclined to open numerous small accounts, owing to the difficulty in recovering debts, and that, for this reason, they prefer dealing only with wholesale houses of responsibility. Mr. Consul Pauncefote is not prepared to admit that a hurried, and perhaps incorrect, report sent in early is better than a late and correct report. Mr. Vice-Consul Warburton, of La Rochelle, points out that although there were enormous decreases in both the imports and exports of La Rochelle last year, the British trade with the port maintained its position, and in the imports displayed an increase of volume and value. The vice-consul emphasises his recommendations of last year as to the absolute necessity of having commercial travellers to bring goods under the notice of buyers. Samples without some one on the spot to sell the goods are of “no earthly use.” For the same reason, Mr. Warburton is not in favour of consulate sample rooms. The depression of trade has led to a strong feeling against the importation of foreign goods, and against those who import them—even when they are French traders. This state of things would, in the vice-consul's opinion, make it very undesirable to push consular officers to the fore in the disagreeable position of agents for the sale of goods.

Continental Wool Sales.

AN EXAMPLE OF MANUFACTURING ENTERPRISE IN FRANCE.

Many sudden changes and fluctuations have come over the French woollen market in recent years, says the *Liverpool Journal of Commerce*. These variations in 1886 were remarkable; prices went down to the most ruinous point ever reached, and, after advancing to the highest level, receded to a reasonable average. Manufacturers, under these circumstances, passed through alternating periods of depression and of unwonted activity, but avoided every thing in the nature of rash speculation. Indeed, the very centres from which the signal for a revival had sprung exhibited commendable moderation in the hour of victory, and the improvement from which they were the first to benefit continued favourable to them throughout. At the close of 1885, the price of wool had fallen below the values in such years of crisis and panic as 1848 and 1870. It was thought the lowest limit was reached, but in May, 1886, prices underwent a further decline of from 10 to 15 per cent. A pessimist spirit was abroad. Theoretically it was pointed out that the price of wool would go down to the price of cotton, because new countries, such as South America, Australia, and the Cape, had to be reckoned with, just as they had been in regard to wheat—all the conditions of supply and demand had been changed. Other doctrinaires emphasised this theory, declaring that the rise in gold was playing a leading rôle in this depreciation of values. Silver having been dislodged as a standard, and reduced to subordinate functions, the scale of all values must of necessity, according to this view, have been revolutionised, inasmuch as the bulk of merchandise and exchanges, being set against a minor sum of monetary values, a corresponding contraction had taken place in all prices. The fall in wool, like that in silk, wheat, and iron, was therefore attributed to an intense crisis in the money market. Now, what happened? French manufacturers were at their wit's end. Great distress was beginning to be felt in the case of fabrics which, like the merinoes of Rheims and Picardy, call for an extreme reduction in general expenses, an extensive production, and perfected machinery—all this being due to foreign competition. It was felt that, if manufacturers sought to diminish their production, they would be raising their working expenses. If, on the other hand, they determined to produce as much as in the past, they would be threatened with an accumulation of stocks for enormous losses. Buyers limited their orders in the anticipation of a speedy fall. Speculators were by no means inclined to purchase at even the then existing low rates. The result was a smaller demand for fabrics, and fewer purchases of raw material. Suddenly, on the opening of the La Plata wool sales at Antwerp on May 20, 1886, two or three firms of Roubaix and Tourcoing decided by a master stroke to ward off the ruin with which their industries were

threatened. They bought up all the wools on the Catalogue. Next day, prices went up 20 per cent. The manufacturers who had not joined in the operation were divided in their counsels. Some were for accepting the *fait accompli*; others resolved to await the result of the June sales of wool in London. These sales ratified the previous advance, and the revival continued rather briskly until September. At that date, the increased value of certain descriptions was 45 or 50 per cent., and 60 per cent. for merino wool. The operation which led to the change was not the result of the slightest rashness; it argued sound judgment and rational observation of current values and of the real wants of the market. Here it should also be noted that the Roubaisians merely raised the value of their fabrics 5 and 10 per cent., in response to a rise of 20 per cent. in merino wool, and were content to receive 15 per cent. when the raw material had gained 40 per cent. The result was clear. Having bought up, at the outset, all they required, they could afford to be satisfied with reasonable profits, and not only avoid paying the higher prices asked in September but keep their trade in their own hands.

The Cotton Spinners' Association.

Commenting upon the annual meeting of this Association, which was held in Manchester a few days ago, the *Manchester Courier* says:—The President called the attention of those present to the almost imperative necessity of a thorough reorganisation, upon a stronger and broader footing, of the constitution of the Society. Anyone conversant with the position of the cotton trade during recent years will at once admit that such a step is not being taken too soon. The keen competition in trade has introduced so many abuses from within, and so many attacks from without, that they can only be grappled by a strong representative body, whose interests and inclinations are materially affected by the present unsatisfactory state of affairs. The time is not long gone by when this district could hold its own against all comers “without fear or favour,” and it would be absurd to suggest that the energy and ability which, at the instance of our forefathers, created this gigantic industry are now non-existent. Failing action of the manner suggested, it is not easy to foresee how any effectual check can be administered to a condition of things undoubtedly on the decline. The most prominent points mentioned for consideration by the President were—The value of combination in defending the legitimate trader from the operations of speculative confederacies; the alteration of some customs in regard to weights, &c., which are continually bringing the Liverpool cotton brokers into dispute with the spinner; and an improvement in the law known as the Limited Liability Act. As regards the first point, the unmistakably victorious experience of a few weeks ago proves conclusively that, in case similar circumstances arose, the trade would almost unanimously adopt a policy that so rapidly brought about the desired remedy. With respect to the question of details, as relating to Liverpool, it is a surprising fact that claims which bear upon the surface such equitable evidence should be so persistently ignored by the broker. The possibility, however, of their having in the future to enter into negotiations with a more compact and powerful association may exercise some influence upon their decisions. The Limited Companies' Act is a matter that requires great consideration. Under proper restrictions, it is in principle the most impartial form of trading that can possibly be suggested, and, with a properly defined basis, is the one that the probable trade of the future will be conducted upon. At the same time, the commercial prosperity of the district, and the safety of the unwary shareholder, must not be jeopardised by conditions made, unfortunately, in such a manner as to apply mainly to the interests of a class of gambling promoters. It is not likely that there will again be such a provision of altogether unnecessary productive power as has been known in the past, but, in any case, the cotton interest may be expected to hesitate to accept any but the most substantial guarantees that such a calamity will not be repeated.

The small bits of coloured paper hitherto used as pocket-handkerchiefs by the inhabitants of Japan, are no longer to be permitted in fashionable society, and the Empress of the country will set the fashion of using the daintiest piece of gauze that can be manufactured, therefore, as this is the result of an official change, it is probable that the example set in “high places” may be followed by those of lower degree, and hence there is a prospect of an increase of trade in the handkerchief weaving departments.

New Invention in Calico Printing.

The severe competition in recent years in every branch of industry has set innumerable keen wits to work, with the result of many startling improvements in various trades; but there are few which compare in importance with the "simultaneous" process of colour printing, which promises to entirely revolutionise some classes of calico and velvet and velveteen printing, and also the printing of advertisements in colours. We need not describe the ordinary process, which, it is well known, requires the material to be put separately through the rollers for each colour, and for some classes of plain printing this still holds the field; nor need we more than allude to a new machine shown at the Manchester Exhibition, by which ten colours can be printed at once, which was a great stride forward; but the novel character of the "simultaneous" process will be at once understood when we mention that by it, if required, 1,000 shades could be printed off at one impression. Instead of using engraved rollers, as in ordinary calico printing; or stones, as in the case of coloured advertisements; the designs or pictures are "built up" in a case in solid colours, specially prepared, somewhat after the style of mosaic work. A portion is then cut or sliced off about an inch in thickness, and this is wrapped round a cylinder, and the composition has only to be kept moist, and any number of impressions can be printed off on calico, velvet, or velveteen, the colours being thoroughly fast. The chief purpose to which the invention is now being put is the production of coloured "picture posters," in which there is great scope, as the fashion of late has been setting so much in this direction, and it is not pleasant to learn that America has hitherto distanced all competitors in this department, a large proportion of the fancy posters coming from across the Atlantic. This trade we may now hope to keep in this country, for the "simultaneous" process claims not only to be cheaper, but also of a much more durable character than the American productions, being waterproof, and capable of standing all weathers. But the great future which the patentees consider lies before the invention is in the direction of calico and velvet and velveteen printing; and here, again, manufacturers have been suffering from severe foreign competition. If the new process fulfil its expectations, and we have seen some admirable specimens of velveteen containing a large number of colours which were printed at one impression, then we may anticipate that England will once more take the lead in these important branches of industry, and a much-needed relief be afforded to many of our manufacturing districts. A syndicate has been formed for working the patent.

The American Tariff.

The following circular has been issued:—Bradford Chamber of Commerce, Bradford, August 19th, 1887. The Council of the Bradford Chamber of Commerce, having been asked for an official declaration as to the true classification of certain wool tissues, consider that for the present purpose it will suffice to determine whether worsted coatings are—woollen cloths provided for in No. 362 of the United States tariff, which pay a duty of 35c. per lb., and 35 per cent. *ad valorem* if under 80c. per lb., and 35c. per lb. and 40 per cent. *ad valorem* if over 80c. per lb., or worsted goods belonging to No. 363, which in the tariff are described as "all manufactures of every description composed wholly or in part of worsted not specially enumerated or provided for by this Act"—such goods pay duties varying from 10c., 12c., 18c., 24c., and 35c. per lb., and 35 per cent. *ad valorem*, and 35c. per lb. and 40 per cent. *ad valorem*, according to their respective values per lb. The Council beg to declare that wool fabrics are divided into two great categories, viz.:—Worsted and woollens, which are distinguished from each other by the different processes which the wool, common to both, has to undergo in preparation and spinning the yarn from which such tissues are woven. Worsted yarn is used for the production of worsted tissues, and woollen yarn for that of cloths or woollens. Worsted coatings are invariably composed of combed yarn, and are, consequently, worsted fabrics, belonging to No. 363 of the tariff. To prove this, it will suffice to describe the difference between worsted yarn and woollen yarn. Combed or worsted yarn is such in which the wool fibres are placed in the direction of the thread, parallel to each other, by combing. This is the last process which the prepared wool (technically called top), has to go through before spinning, and which also removes the smallest fibres, called noils. Combing formerly was done by hand, and now by an almost automatic machine. The yarn so produced is characterised by an extreme smoothness, evenness, and freedom from knots and noils, and its very appearance distinguishes it from woollen yarn. This, after having undergone a preparation for spinning, similar to that given to wool intended to be spun into worsted, is finally scribbled before being spun. Whilst combing, as already stated, places the fibres into parallel lines, and removes the noils, scribbling leaves in the

noils, and mixes the fibres in every possible direction, so as to overlap each other, and to present their serrated surfaces in the greatest variety of ways, thus increasing the milling or felting qualities of the wool. The textures woven from such yarns obtain the soft appearance and handling—in fact, the distinctive features which separate woollen cloth from worsted tissues. That distinction is so evident that even an inexperienced eye and hand can have no difficulty as to the classification of either. To recapitulate:—Worsted goods are such as are made from wool-yarns on which the last process before spinning has been the combing, and—Woollen goods or cloths such of which the yarn has, in its last stage before spinning, undergone the process of scribbling. The length of the fibre is, and has ever been, immaterial with regard to the classification. It may be incidentally mentioned that the present rates of duty on worsted coatings are calculated to amount to 80 per cent. on their value in England. Given under my hand and seal. Jacob Behrens, President. John Darlington, Secretary.

The Drapers' Company and their History.

The Drapers' Company, though third in civic precedence, possesses a larger extent of corporate estate than any other company, yielding in 1880 an annual income of £52,970, a revenue which has doubled itself during the last half-century, and now far exceeds that of the Salters, Vintners, Ironmongers, and Haberdashers combined. The origin of this company, like that of the other City Guilds, is to be found in a fraternity or brotherhood banding itself together for the promotion and protection of its social, political and industrial interests. As early as 1180, the Gilda Parariorum was amerced as an adulterate guild, that is, without a Royal licence, and a few years afterwards, Henry Fitz-Alwyn, the first mayor of the City, is claimed as a member of this guild, as well as of that of the Mercers. The ancient members of this craft lived in the vicinity of Cornhill, having their guild-day at St. Mary's Church, attached to Bethlehem Hospital, Bishopsgate Street, and their altar and light at St. Mary Woolnoth. The first ordinances appear in 1322, and, towards the end of the century, a regular weekly market for the sale of cloth was established at Blackwell Hall, Basinghall Street, at which the Drapers had the sole right of selling, and, in the beginning of the succeeding century, the keeper of the hall was appointed by the Drapers' Company, and presented to the Lord Mayor and Aldermen for confirmation. The first extant charter of this company bears date 38th Edward III. (1364). This charter gives the company the monopoly of the trade, inasmuch as it ordains and grants that none shall use the mystery of drapery unless apprenticed thereto, or admitted by common consent; also that none shall sell cloth in the City or suburbs except drapers free of the said mystery. Moreover, that the mystery of weavers, dyers, and fullers, shall in no way interfere with the making, buying, or selling of any manner of cloth or drapery upon pain of imprisonment, or forfeiture of the cloth, or its value, to the King's use, the rights of the Prior of St. Bartholomew being excepted. The charter of 1438 fully incorporated the company, and the charter of 1465 gave power to hold lands to the value of £20 per annum, which, by a subsequent charter of 1607, was increased to £200 per annum. The latter charter vests the government of the company in a master, four wardens and assistants, under which it has been carried on to the present time.

Fireproof Textile Fabrics.

The constantly recurring disasters which trace their origin to some accidental firing of textile fabrics has caused a great deal of attention to be devoted to the discovery of some effectual means of making them incombustible. The great objection against such chemical agents as have at various times been suggested has been that, while some of them destroy bright colours, others render the stuff materials both stiff and heavy. Dr. Doremus has been trying several methods for rendering materials fireproof. Twenty years ago, the light summer dress of one of his children caught fire, and, before the flames could be extinguished, they had accomplished their fatal work. This heartrending accident induced him to make a series of experiments to prevent its recurrence. He dipped articles of clothing in solutions of tungstate of soda, borax, and many other chemicals. After drying the textures, he found them unflammable, but none of these agents were as effective as a solution of phosphate of ammonia in water. If delicate tissues, such as those of which ladies' veils are made, or curtain materials, or thicker textures of cotton or linen, are placed in such a solution, wrung out, and stretched to dry, it will be impossible to set fire to them. They will blacken and be destroyed where the fire touches them, but the flame will not spread, neither will there be any residue of red-hot cinders; even the little golden worms, as children call them, will not be seen when the tissues are removed from the fire.

The Russian firm of Kudrin and Co., has equipped an expedition, which has already started for Central Asia, for the purpose of laying out cotton plantations, constructing works for pressing cotton, and making an analysis of the soils of Turkestan and the Transcaspian region. The expedition includes a professor of the Kazan University, an agriculturist, and an engineer.



ORIGINAL DESIGNS.

On our first plate is a design for Damask. This is a bold pattern, well suited for this class of fabric.

* * * *

On our second, we give a small repeating pattern for Tapestry for Upholstery purposes. It is also suitable, with the addition of a border, for a Table Cover.

* * * *

On our third plate is a design which we offer as a suggestion for a Silk Handkerchief. It is from the studio of a well-known French designer.



MONTHLY TRADE REPORTS.

Wool.—During the past months, the demand for wools has been above the average, and, generally, firm prices have been realised. The stocks in the hands of staplers are not large, and this, coupled with the fact that a difficulty has been experienced in replacing at profitable rates, has caused them to remain firm in their demands. Home grown wools have met with most inquiry, some of the lower classes being in good request. Buyers of Botany have operated very cautiously during the month, preferring to wait the results of the September-October sales in London. The yarn branches have not shown much variation, orders, both for home and foreign consumption, have been received in fair numbers, but, generally, they have been small in bulk. The firmness with which spinners have stood out for better prices has restricted, to a great extent, the giving out of orders. The only concession has been in Botany yarns, and this has been made in order to keep machinery running. In the piece trade, a fair business has passed for the home trade, and, for export, some moderately good orders have been taken for America and Canada.

Cotton.—There has been but little change in the markets for the raw material during the past month, the demand has been an average one, and prices have not been quotably different. The yarn trade has no new features; spinners complain much of the unsatisfactory prices they are able to procure, manufacturers, generally, buying in small lots for present use, and, where they have shown a speculative spirit, it has generally been by offering producers lower prices for their yarns. Still, the latter seem, as a body, to think that this state of things will shortly change, and that merchants and manufacturers will operate largely. The cloth branches have altered but little, manufacturers, in most cases, being under orders, and, unless fair prices have been offered them, they have generally refused new business. There are, however, exceptions to this rule in cases where orders are wanted to keep machinery running.

Woollen.—This branch of textiles has, on the whole, improved during the past month, perhaps, the least satisfactory part is the trade in the heavier classes of woollens, such as pilots and presidents, for which the demand has been of a dragging nature. The better classes of worsteds still keep a good hold on the markets, although the demand is rather less than usual. Woollens, of the tweed class, have sold fairly well, in many cases, as repeat orders for the coming season. In the medium and lower makes, specially adapted for the clothing trade, a moderately good business has been done, and stocks in the hands of manufacturers are generally light. Attention is now being turned to the production of new patterns for the forthcoming seasons, and some admirable specimens are sure to be put before merchants in a few weeks.

Linen.—In this industry only a moderate business has been passing, in fact, buyers have been few, and the orders placed during the past month have been rather meagre. In the damask trade, the demand, both for home and foreign account, has fallen

off, and, in consequence, producers have begun to curtail the output of goods. In sheetings, and such like goods, nothing new may be noted, orders being few. In fabrics of the towelling, toilet, and similar descriptions, orders could be had, but at prices that do not tempt manufacturers, as they are unremunerative. In the jute branches, a considerable improvement, both in demand and prices, has recently taken place, and the outlook for the future is cheering.

Lace.—This trade, which is generally marked by depression in the month of August, shows but faint signs of improvement, although there are those who are hopeful of a better state of things within a few weeks. Competition is keen in the extreme in every branch. Cotton laces, such as Valenciennes and Point de Paris, have only been in small request, but a rather better demand has ruled for torchon and Maltese laces, still rates are low and goods abundant. In the curtain branch, there are still many machines idle, and, although a moderate sale is going on, prices are not good. There are no novelties of importance to note.

Travesian Cloth.

We have had our attention drawn to a material introduced to the trade by Mr. David Madeley, velvet manufacturer, China Lane, Manchester, and Royton, near Oldham. This fabric is called Travesian Cloth, and is offered as a material for the use of both ladies and gentlemen. For the latter, it has undoubted advantages as a summer vest fabric, being light in weight, yet possessing such a degree of warmth as to act as a safeguard in this climate of ours, where sudden changes of weather are frequent. But, perhaps, it is a little late for summer clothing, yet this fabric is worthy of mention. It is suitable for ladies wear in all seasons, as a material to be worn in conjunction with others, and for purposes too numerous to mention. On our special plate, we give a sample of the Travesian Cloth, as well as of others, made by Mr. Madeley, including one or two further samples of his Patent Electric Velvet, a material destined to win much favour from ladies.

The Trade of the World.

[From Special Telegrams and Sources of News all over the World.]

A very pretty material called *peau de soie* has just made its appearance in Paris. It probably derives its name, *peau de soie* (silkskin), from the silky, soft, and even surface it presents. In it we can neither trace the texture of *faille*, the stripe of *surah*, nor the grain of *satin a la reine*, and yet it is not a plain material like sarsenet. Its wearing qualities leave nothing to be desired. *Peau de soie* is a novelty that would not brook delay, and which has forced itself to the front without waiting for the turn of the season, yet we feel quite sure it will be a very important factor in most autumn costumes. At the present, as may be assumed, it holds the place of honour, and is only seen under exceptional circumstances like most novelties at the outset. We have seen some costumes of this material, blended with embroidered tissues; the effect was very charming. It makes up neatly with woollen materials when tastefully chosen, and will, doubtless, be well received in fashionable circles in England.

THE IMPORTATION OF FRENCH TEXTILES INTO SENEGAL.—A German correspondent says that the importation of French textiles into Senegal is considerable, although German competition is beginning to make itself felt here as elsewhere. The most saleable stuff is what is known as "Guinee," which is in favour all over the country; then Vosges linen, which meets with a good demand among the coloured population, and patterned calicoes, which are in great request, especially among the women. Striped patterns find most favour, viz., green, white, red, and blue alternate stripes. Coverlets or blankets are not much sought after.

JAPANESE TRADE AND GERMAN COMPETITION.—Our correspondent in Yokohama writes that the import trade of Japan is continually on the increase. The markets are at present subject to sudden surprises, but by-and-bye they will, no doubt, acquire a normal and regular course. The most recent statistics we have at our command are those of 1885, from which we see that the imports for that year amounted to 28,847,385 yens, the yen being equal to the Mexican piastre. The largest exporters to Japan were England to the extent of 12,415,421 yens, China 5,763,053, India 3,596,994, United States 2,726,184, Germany 1,695,652, and France 1,319,866 yens. It is to be observed, however, that England's share is continually on the decline, having fallen off to the extent of 4,000,000 yens between 1881 and 1885. France has lost even more ground, and the exports from that country to Japan scarcely exceed the half of what they were in 1881. Germany alone has not made any great progress. The value of German trade imported in 1881 only amounted to 800,000 yens. This fact is due to the proposed rating influence of the Germans in Japan, and it must also be borne in mind that the principal import houses in the open ports are of German origin.





Weft:—

6 picks Black worsted as warp.
 12 „ Blue „ „
 7 „ Black „ „
 3 „ Black and Crimson silk twist made as warp.
 6 „ Black worsted as warp.
 12 „ Blue „ „
 10 „ Black „ „

Finish clear and soft.

56 picks.

Weight 19 to 20 ozs.

7,072 ends in warp; 104 ends per inch; 52 picks per inch; 13's slay; 8 ends in a reed; 68 inches wide in the loom; 56 inches wide when finished.

Woollen Trousering.

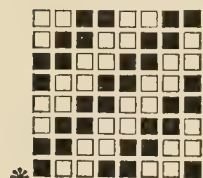
No. 480.

Warp:—9 ends Brown, 10 skeins woollen.

6 „ Olive 2/20's „

1 end Black and Crimson Twist.

Weft:—All Brown, 10 skeins woollen.



*

Design.

Straight Draft.

1,792 ends in warp; 28 ends per inch; 26 picks per inch; 14's slay; 2 ends in a reed; 64 inches wide in the loom; 56 inches wide when finished.

Trade Change.

The firm of Cowlshaw, Nichol and Co., Limited, Manchester, London and New York, has just undergone a change. The property and assets of the firm have been purchased by Messrs. Charles E. Smith, S. W. Cocks, W. B. Smith, Alex. Milne, G. M. Cowlshaw, and H. W. Cowlshaw, who will carry on the business in this country under the old title of Cowlshaw, Nichol and Co., and of Nichol, Cowlshaw and Co., in the United States. This firm's display of tapestry curtains, table covers, silk and other varieties of upholstery fabrics at the Manchester Exhibition is very attractive, and, therefore, commands great attention.



MACHINERY, &C.

Allen's Patent Gumming Machine.

Some time ago, we gave a notice in our pages of Allen's Patent Gumming Machine, made by the Allen Machine Company, Limited, Halifax. Since the publication of that notice, the company have made exhaustive experiments in order to produce a machine which would fulfil all the advantages of the original one, whilst the cost could be greatly reduced. The success attending these experiments will be understood when we state that the price of the first machine was 30s., that now put upon the market is 16s., and the latter will perform its work in every respect as well as the former. This is undoubtedly a great achievement, and will enable the machine to gain a very large sale, for it is not too much to say that there is not a single trade in existence in which it will not come as a boon. In every business, there is more or less labelling of parcels, packages, boxes, &c.; hitherto these have had to be done entirely by hand, and has been not only a slow, but a dirty, process. By the use of this machine there is a great saving in labour, whilst cleanliness rules in place of dirtiness. The illustrations given will convey a good idea of its working. Fig. 1 shows its application to labels where the entire surface requires to be coated with gum. Fig. 2 shows its application to invoices, wrappers, etc., where only the edge needs gumming. The machine consists of a trough for holding the gum, in which a metal cylinder revolves—the larger of the two shown in the illustration. There is also a roller covered with india-rubber. The method of using is to turn the handle shown at the right hand side of the illustration with one hand, whilst, with the other, the label is held beneath the india-rubber roller. Passing under this, the label emerges above the metal cylinder which, as before stated, revolves in the gum, and thus imparts an even coating to the label. The mode of gumming invoices is the same with one exception—a small india-rubber roller is fixed at the end of the machine, and here must be placed the invoice, or other

paper, requiring to have only its edge gummed. The machine will take in labels up to about 4½ inches wide. The process is most simple, and the result perfect. Although any kind of liquid gum may be used, the Allen Company have prepared a special kind to which they have given the name of gumoline. It is described as of extraordinary strength, free from sediment and all injurious chemicals, and much cheaper than other

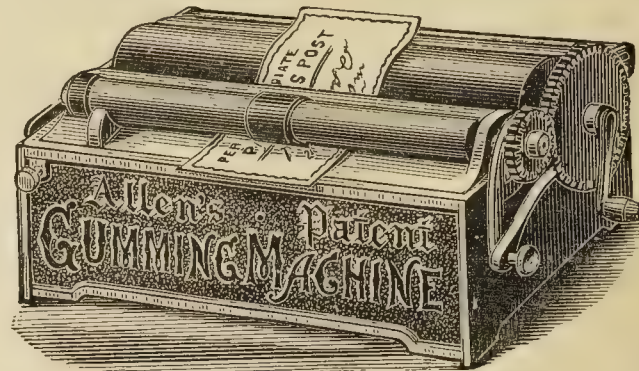


Fig. 1.

liquid gums upon the market. This is sold in quart bottles at 1s. 9d. each. In reference to the machine, we may say that it is applicable for coating labels with any liquid compound, and, if supplied with water, it will damp gummed labels, and thus obviate the necessity of licking them. We have a few of the gumming machines on hand, which

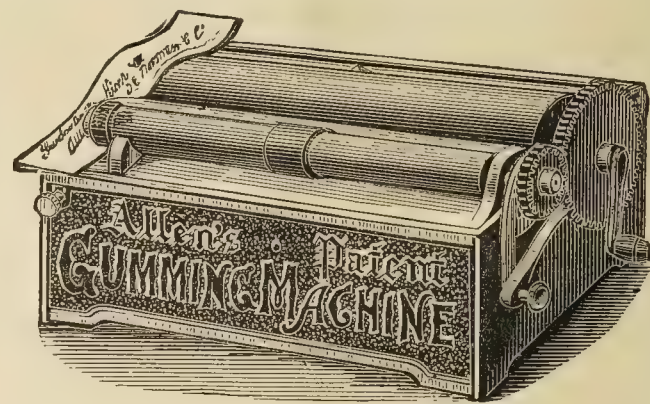
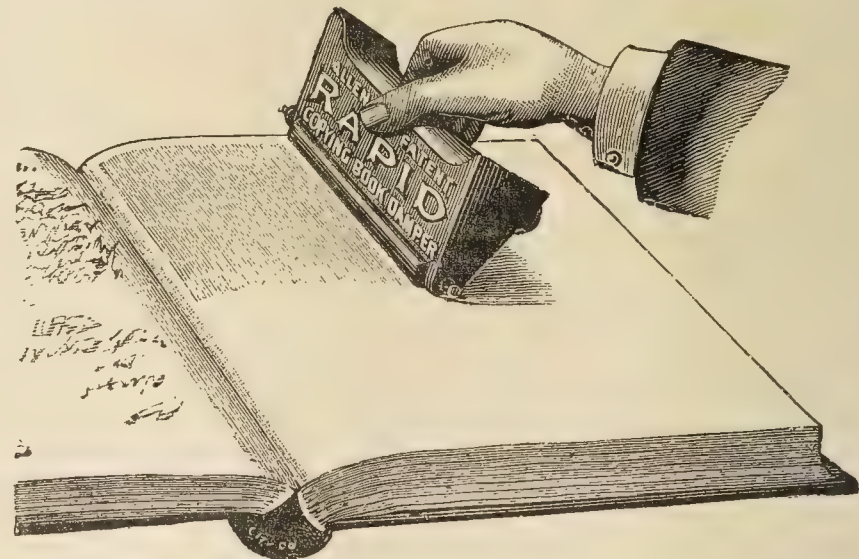


Fig. 2.

we can supply to any of our readers, on receipt of P. Order for 16s., or, including bottle of gum, for 17s. 9d. (carriage not paid). We now come to speak of another useful invention which has recently been patented by the Allen Machine Company. This is the Rapid Copying Book Damper. As is well known, the method of copying letters at present in use is to cover the leaf of the book with water from a



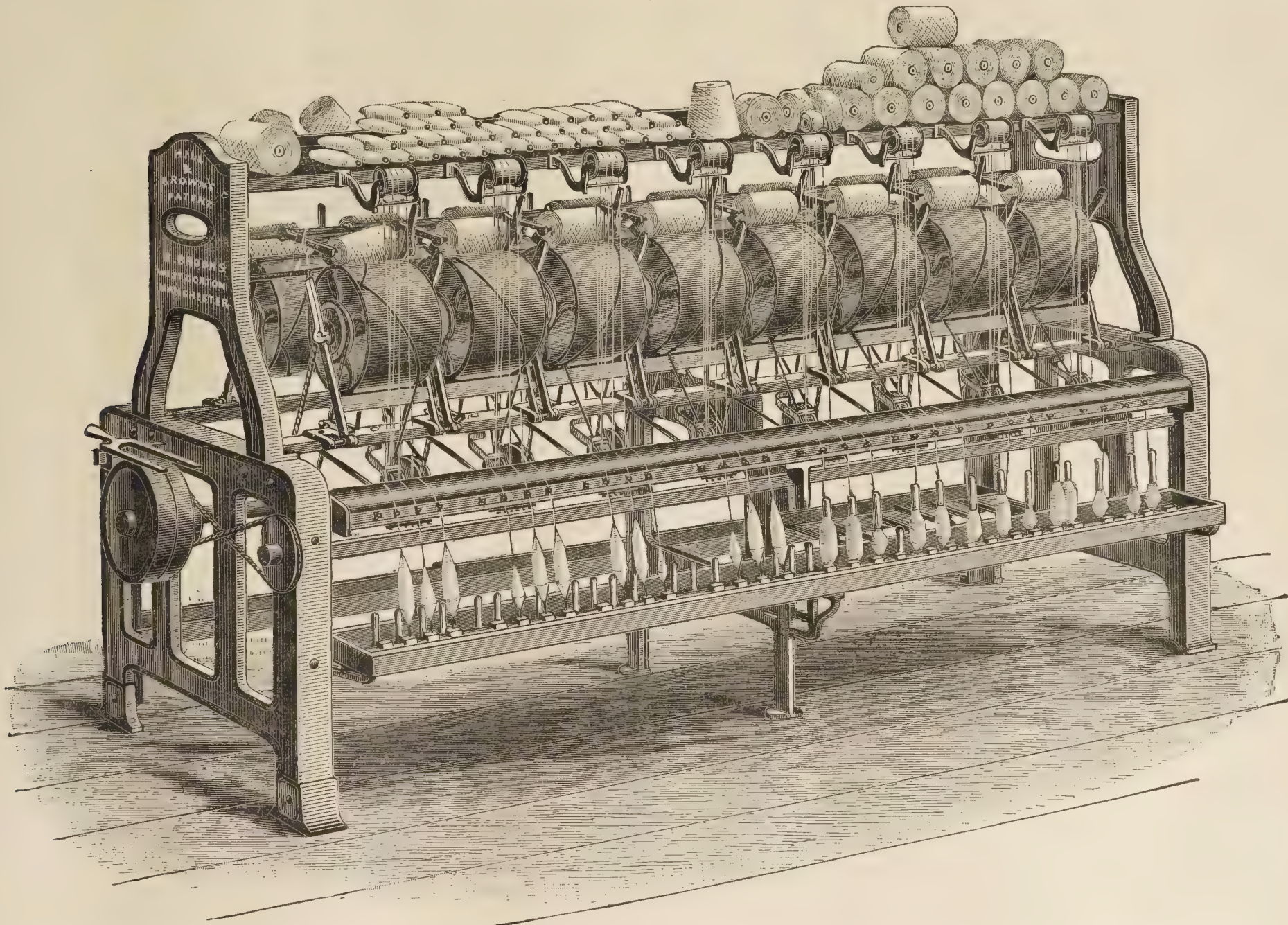
brush, then apply blotting paper to absorb the excess of moisture. The Damper, shown in the illustration, only imparts sufficient moisture to copy the letter, and no blotting paper is required. It is filled with water which filters slowly on an india-rubber roller, thus delivering the moisture to the paper. When not in use, it stands roller upwards. There are no parts to get out of order, it is simple in construction and low in price.

Hill and Brown's Patent Winding Frame.

In a recent issue, we referred to the above machine, which is made (and exhibited at Manchester Exhibition, Stand No. 443), by Mr. Samuel Brooks, Union Iron Works, West Gorton, Manchester. Considering the great amount of attention which this frame has received from interested visitors to the Exhibition, and recognising its importance as applied to the various textile trades we represent, we have considered it advisable to give an extended description of it. The object of the frame is to wind the yarn either in cylindrical or in conical form on to spools, or bobbins without heads, in which a quick traverse, or to and fro distribution of the yarn is necessary to bind the coils together, thus building the ends straight and square to the axis of the spool, and rendering

the ravelling of the yarn at the edges of the spool impossible. The first noticeable feature in this frame is the hollow traverse cylindrical cam or drum formed in two parts, having an oblique slot extending around its circumference, and from side to side. The yarn to be wound passes through this slot, and is thereby guided on to the bobbin or spool at the required pitch. A fixed straight edge or blade is arranged to come between the surface of the hollow traverse drum, above mentioned, and the spool, as near as possible (without touching the drum or surface of the spool) to the point of contact between the outer cylindrical surface of the hollow traversing drum and the surface of the thread on the spool. This fixed edge compels the yarn to wind on the spool at a point also as near as possible to the surface of the drum, and to be distributed practically to the extreme limit of the traverse produced by the reversed helical slit between the two parts of the hollow drum. Without this improvement, there would be more or less angles in the thread between the surface of the hollow drum and the point at which it winds upon the spool, and this angle has more effect to prevent the thread from being distributed to the full limit or traverse as the spool increases in diameter, owing to the increased length of thread between the hollow drum and the point at which it winds on to

placed as to revolve towards the operative standing in front of the machine. An arm connects the box, carrying the detector wires, with a catch which supports a prop, this in turn supporting the drum. When a thread breaks, the detector wire falls, and, coming in contact with the triangular shaft, plucks forward the arm first mentioned, thus releasing the catch, and this, becoming free, causes the prop to be released, and allows the drum to fall against a brake surface, and the winding is instantly stopped and waste of yarn prevented. The thread being pieced, the drum is again placed in position by the operative simply moving a handle, and, after lowering the spool on to the surface of the drum, the winding proceeds. The advantages of the machine may be briefly stated:—It will wind yarn on to paper tubes or bobbins without heads—and consequently saves considerable expense in bobbins. The yarn is so wound that it will not slip off the edges. Where two headed bobbins are used, as on the old machines, should one of the heads get broken, the yarn slips off the edge and causes great waste, and this, as is well known, is of very frequent occurrence. The yarn will not unravel, and will bear handling, and may be carried any distance without liability to injury. Almost any diameter of spool can be made, thus increasing the quantity of yarn upon each



the spool. Another improvement specially applicable for the winding of small spools of sewing cotton, &c., when the drums are small (being then made of cast iron), consists in covering the axis within the hollow drum with a guard or shield, which does not rotate with the shaft, and this is effected by suspending a thin plate on the axis of the hollow drum, extending the length of its interior, coming nearly close to its end. The weight of the plate suspended below the axis prevents the plate from rotating with the axis, and the guard thus acts to prevent the end of a thread, when it breaks, from accidentally catching and winding upon the shaft in the interior of the drum. The slit in the drum is shown in the illustration as making one traverse each way for each revolution of the drum, but, if desired, it may be arranged to make two or more traverses to and fro for each revolution of the drum. This is important as showing the adaptability of the machine to the varying requirements of spinners of different classes of yarns. The frame is made for winding either single ends, or several ends upon one spool. In the latter case, the frame is fitted with an excellent arrangement for instantly stopping the drum when an end breaks. Our illustration gives a general view of the machine with stop motion, and creel to wind from three cops or Rabbeth bobbins to each spool. The thread passing from the cop, runs through, and holds up, a detector wire fixed in a box or apparatus, thence over a top carrier pulley, and under a bottom one, to the slit in the hollow drum by which it is wound upon the spool. A triangular shaft is so

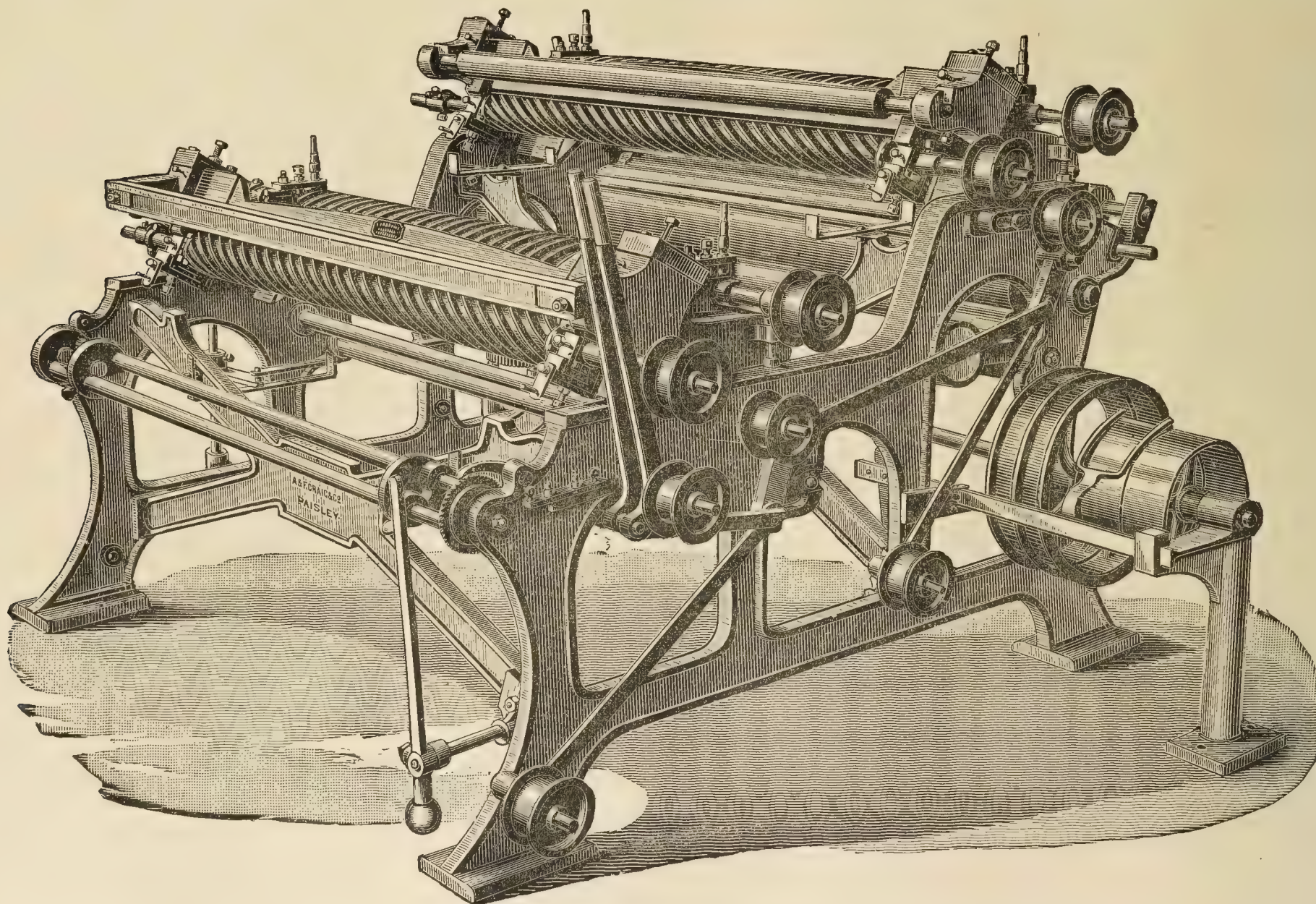
spool. In the ordinary system, where wooden bobbins are used, the quantity of yarn on each spool is limited by the diameter of the bobbin heads. Owing to the traverse being automatic, there is no strain upon the yarn by a traverse motion, which is dispensed with, and the highest speed the yarn will stand can be attained, consequently, increased production. The machine is exceedingly simple in construction, with no parts liable to wear out. It is noiseless in action, not a single wheel entering into its construction. It is equally suitable for all classes of yarn, viz.:—cotton (single or double), wool, worsted, and silk, and any traverse of drum can be made to suit the purpose the yarn is required for, and the creels of the machines the spools will be placed into. It will also wind parallel or conical spools as may be required. We cordially recommend the machine to the notice of our readers.

A Quadruple Cropping Machine.

The cropping machine, like most other mechanisms in use, at the present day, not only in the textile, but in all other trades, has from time to time claimed much attention, and been the subject of careful study, from those interested in the production of machines of this class; many improvements have been made, and, by degrees, it has been brought to such a high state of efficiency that the shearing or cropping of fabrics, requiring that operation, is now performed in so satisfactory a manner that, appa-

rently, there is little to be desired in the way of improvement. A machine of this class, illustrated below, has been patented and is made by Messrs. A. F. Craig and Co., of Paisley, and which we have pleasure in describing for the benefit of our readers. The machine consists of the usual spiral and revolving knives with their fixed blades, of which there are four. The beds or bars over which the cloth passes are placed so as to bring the fabric into contact with the revolving knives. The drawing-through rollers, at the back of the machine, which draw the cloth over the beds, and take it regularly through the machine, the tension apparatus and stretching bars, at the front of the machine, which regulate the strain or tension upon the cloth and keep it from getting into folds and creases, with the rollers for guiding the cloth, are all arranged upon a strong framing, which may be fixed down to a floor or to a stone foundation. The cropping or shearing apparatus consists of a circular tube or bar having a number of steel blades wound spirally round it, and the edges of which project about one inch from the body of the bar. These steel edges revolve against a stationary flat blade, the edge of which is placed exactly under, or over, the centre of the spiral knife, and which is hollowed out to the radius of the circular cutters, so that the latter work in perfect contact with it, in fact, are ground into a perfect bearing surface with the edge of this flat blade. The action, therefore, of the

through rollers are three in number, one of them being covered with cloth or india-rubber, so as to take better hold of the material operated on, and they are driven by wheels from the main shaft of the machine. These rollers may be weighted at pleasure, so as to flatten, or calender, the goods to a certain extent if required. The tension apparatus consists of two round bars fixed to discs at either end. The cloth passes between these bars, and being turned round more or less, they vary the strain upon the fabric; from these, the material passes over two iron rails, which tend further to tighten it up, and the edges of which take out any folds or creases that may occur. The knives are made so as to be raised from the cloth, or lowered into contact with it at pleasure, whilst the machine is in motion, and the amount of pressure which they will exert upon its surface is regulated and kept uniform by means of screws, the points of which bear down upon the frames of the machine when the knives are in position to cut. The pieces of cloth to be cropped are sewed end to end so as to be drawn continuously through the machine, and, as the sewed part approaches each revolving spiral, the attendant, by means of a simple contrivance, raises it with its corresponding blade so as to allow the projecting sewed part to pass without being cut or injured. Messrs. Craig have for many years made a speciality of cropping machines, and at present upwards of 400 of their machines are in use.



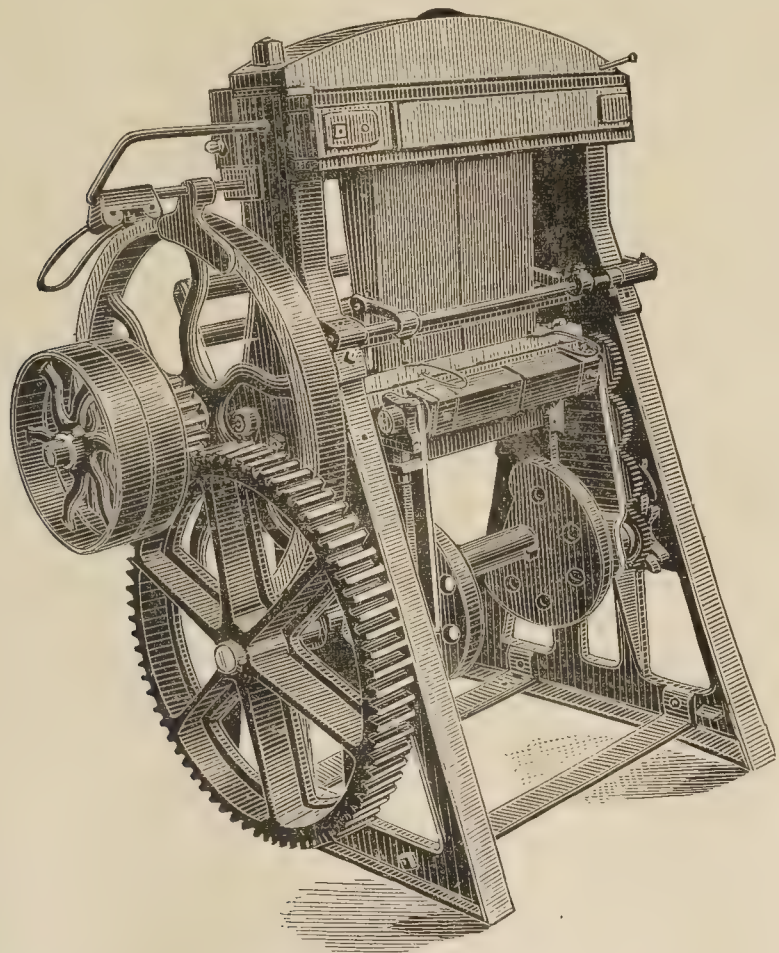
revolving spiral knives against the edge of the fixed blade is identical with that of a pair of scissors, and, as these knives revolve at a speed of from 1,000 to 1,500 revolutions per minute, this action is continuous, so that neither projecting thread nor fibre can escape being cut as the cloth slowly passes under, and in contact with, the edge of the fixed blade. As before stated, there may be one, two, three, or four of these cutters, according to the nature of the goods being cropped. One knife is sufficient where it is not desired that the cloth be very closely cut, and when one side only is required to be operated upon. Two are required when both sides of the cloth are to be cropped alike, and in this case, one of the revolving cutters has its fixed blade below, and the other above, and the cloth passes under the one, and over the other, thus presenting the upper surface to the first, and the under surface to the second, blade. For linen goods, the three blades are more generally adopted, the two first acting upon the surface, or right side of the cloth, and the other acting upon the reverse side, which is not wished to be so scrupulously cleaned. If both sides of the cloth are required to be closely cropped, four spirals are employed, two acting on each side of the cloth. The beds, or bars, over which the cloth passes, and that keep it in contact with the cutters, are hollow on their surface, so that the cloth is strained over two edges, the cutter acting upon the material between them, which, therefore, has a little spring or elasticity, thus allowing it to yield to the knife when there is any inequality in its thickness, or any little knots or lumps which, if cut off, would leave a hole in the cloth. The drawing

An Improved Jacquard Card Repeating Machine.

MR. THOMAS NUTTALL'S PATENT.

As in other descriptions of textile machinery, improvements continue to be made in the various apparatus required in the production of what are termed figured, or jacquard, goods. The above named machine is, in many respects, a decided improvement on card repeating apparatus generally used at the present time. From the illustration, a good idea of the machine may be gained by those used to this class of mechanism, and the following description of it will be readily understood. The cutting plates are placed upon a box, or frame, which is moved up and down in slides, the latter being fixed to the sides, or framework, of the machine. The up and down movement is given by cams fitted on the main shaft. This cam-shaft projects through each side of the machine, and, on one end of it, a cam, or tappet, is fixed for the working of the pattern card cylinder, which acts on the ends of the needles, for the selection of the cards to be repeated. In carrying out the operation for repeating, the blank cards are punched with the necessary peg and lace holes, they are then laced together, in the ordinary manner, and placed between the cutting plates, the first card being put upon a cylinder which is turned by a peg lever on the main shaft. This lever gives motion to an intermittent wheel, and to carrier wheels and cylinder, by which means the cylinder draws a fresh card forward to be cut at each revolution of the main, or cam, shaft.

The punches for cutting the cards are countersunk on the top of the heads, and vertical rods are placed in the countersunk heads, and pass up through the eyes, or cranks, of the selecting needles above mentioned. One of the leading improvements in this machine, which was patented a few months ago, consists of the use of either round, or square, vertical rods or spindles, connected to the punches by either metallic, spiral springs, or by india-rubber ferrules or hoops. This method of connecting the vertical rods, or spindles, to the punches prevents the latter from rebounding out of their places by the quick up and down motion of the



box and plates when at work. The machine, when in operation, cuts a full card at one cut, and repeats cards at the rate of 1,000 in fifteen minutes. We have seen it in operation, and were much pleased with its efficient working. The parts of the machine are so admirably arranged and fitted, that it can be forwarded to its destination whole and ready for working. It can be run either by hand or by power equally well. Messrs. Richard Nuttall and Co., Palatine Works, Ramsbottom, near Manchester, are the sole makers of the machine, and they will be glad to submit prices and particulars on application.

The Silk Section at the Manchester Exhibition.

We have been favoured with a copy of the Silk Section Catalogue of the Manchester Exhibition, compiled by Thomas Wardle, Esquire, F.G.S., F.C.S., Leek, a gentleman well-known as an authority on all matters relating to the silk industry. The book, which has just been issued, is not, in the ordinary acceptance of the word, a catalogue only, but is also a compilation of much valuable information relative to this subject. In the introduction of the catalogue, Mr. Wardle states that it has been a leading motive, with the committee of the Silk Section of the Exhibition, to make an effort to revive the English Silk Industry, and to call the attention of the public, and especially of ladies, to the fact that silk fabrics can be made in England, not inferior to those of other countries, both in workmanship and taste, as well as in durability, and also to show, by the examples brought together in the section, that the preferences which have been accorded to the productions of our more fortunate foreign rivals have not always been well founded, he also says that the object of the Indian collection is to illustrate the power and skill of the native silk weaver in India, and the love of patterns which prevails throughout this great dependency. The book contains much interesting matter concerning Indian cocoons, raw and thrown silks, fabrics—woven and embroidered, the utilisation of Tussur silks; there are also copious notes on British Colonial silks and cocoons, with reports of examinations of the structure and physical properties of the cocoons produced by those colonies; there is, too, a chapter on aids to sericultural study, and a list of the entymological collection of dead silk-producing Lepidoptera, and of living silk-producing Lepidoptera—both British and foreign; the chapters on early

Christian Coptic fabrics, on ancient and modern silk fabrics and embroideries, and on ancient and modern appliances for silk manufacture will be read with pleasure and profit. The appendix contains French, Italian, and Indian sericultural and manufacturing statistics and notes. The work, which is illustrated by about 80 plates, will be found invaluable to those interested in the silk culture or manufacture.

ODDS AND ENDS.

It is said that the first carpet manufactory started in St. Petersburg will be opened this autumn, chiefly for the purpose of producing imitations of Oriental carpets.

Eighteen car loads of wool have passed through Ottawa in bond from Victoria, B.C., to Boston. The wool is Australian, and was shipped via sailing vessels and the Canadian Pacific Railway.

A floating exhibition of Spanish products will shortly leave Valencia, and will call at the chief ports of South America, with a view to opening new markets for Spanish goods in those regions.

A meeting has been held in Hamburg of the Association of German Jute Merchants, in which it was resolved to prolong the convention at present existing for a further length of time. An increase of price is to be expected. The meeting decided on obtaining jute for the native market direct from India.

The Association for Promoting Industry in Santiago, (Chili,) which is patronised by the Chilean Government, will open an exhibition at Santiago, in November of this year, of machines used in the preparation of flax (hackling machines). No charge is made for exhibiting space. The best machine exhibited will be awarded a prize of £200.

The civil authorities at Cologne have voted the association, which is about to establish an export pattern warehouse in Cologne, for the Rhineland and Westphalia, a three years' subsidy, namely, 4,000 mks for the first year, 3,000 mks for the second, and 2,000 mks for the third. The establishment of the warehouse is expected to take place very shortly.

The new tariff (says the *Economist*) is a general tariff—that is to say, it contains duties which may be lowered in the negotiations to be entered into during the autumn with Austria and France. According to present arrangements, the new duties will come into force on the 1st of January next, but as negotiations with Austria and France are contemplated, it is not possible to say whether or not they will be put into force at that date. They are thus framed with a view to bargaining, as well as, to a certain extent, for protectionist purposes, and, in consequence, are at high rates. British trade, more particularly in wool and metal goods, will suffer from this change of tariff.

The new school of oriental languages, which is to be attached to the University of Berlin, will be opened on the 18th of next October. The school will be temporarily established in the "Alten Börse, C. Lustgarten 6," and will be open to those studying to become interpreters in connection with the Imperial Foreign Office, and to others desirous of learning oriental tongues. The instruction will embrace Chinese, Japanese, Hindustani, Persian, Turkish, and Suaheli, and in connection with the languages, lectures will be given on the religion, manners and customs, geography, statistics and modern history, etc., of the nations which speak them. The course of instruction will last from 6 to 8 terms for Chinese, 6 for Japanese, 4 each for Hindustani, Arabic, Persian and Turkish, and 2 for Suaheli. The number of the students in each class is not, as a rule, to exceed 12. On leaving the school, each student can receive at request a written certificate of the degree of efficiency he has attained.

The autumn meeting of the Associated Chambers of Commerce will be held at Exeter on the 27th and 28th of September, when various questions of interests to the commercial community will be discussed. Railways and canals are to be the subjects of resolutions, it is said that no Bill will be satisfactory which does not afford adequate protection to traders and agriculturists against undue charges for terminals and undue preferences; and that under no circumstances should a lower charge or difference of treatment between different classes of traders be allowed in favour of the foreigner and to the detriment of native industry; and that a public trust should be formed for the acquisition and working of waterways, with power of compulsory purchase of canals now under the control of railway companies. The other subjects to be dealt with are technical education, board schools, partnership, county-court jurisdiction, tribunals of commerce, city coal and wine dues, the carriage tax, and a Minister of Commerce.



PATENTS.

Applications for Letters Patent.

Automatic clock indicator for measuring fabrics. P. Brimelow, Bury.	10th Aug. 10,930
Adjustable spanners or wrenches. H. H. Lake, London.	13th Aug. 11,095
Axminster or chenille carpets and other fur pile fabrics, and apparatus therefor. R. and G. Morton, Glasgow.	19th Aug. 11,331
Bobbins or pirns for ring spinning, &c. T. and G. and T. K. Wildman, Manchester.	3rd Aug. 10,674
Bobbins for yarn winding. C. P. Robinson, London.	6th Aug. 10,835
Beam engines. G. G. Rhodes, J. S. Critchley and N. Wood, Bradford.	8th Aug. 10,839
Bobbins for spinners. F. R. Donisthorpe, London.	8th Aug. 10,875
Bolt fastener for connecting driving belts. I. Jackson, Glossop.	13th Aug. 11,065
Belting pulleys. A. J. Boulton, London.	23rd Aug. 11,501
Bleaching certain materials. J. Farran, Manchester.	24th Aug. 11,525
Balling machine for forming balls of fibre or sliver for combing. W. B. Lee, Bradford.	27th Aug. 11,668
Construction of rollers for spinning, preparing, &c. W. and S. Lord, London.	29th July 10,541
Cotton warps for weaving mixed fabrics. T. Holliday, London.	3rd Aug. 10,685
Combination tool for use of weavers and for similar purposes. J. Turner, Keighley.	6th Aug. 10,805
Carding engines. J. Heginbottom, Manchester.	6th Aug. 10,807
Checking the time persons enter or leave factories, &c. L. E. Scafe, London.	11th Aug. 10,996
Carding machines. S. D. Keene, Providence.	12th Aug. 11,029
Cutting pile fabrics. J. H. Smith, A. Goddard, L. Higinbottom and T. Mannock, London.	22nd Aug. 11,437
Combined machines for breaking and scutching flax, hemp, &c. A. J. Boulton, London.	22nd Aug. 11,447
Consuming smoke. P. Hodgkinson, London.	24th Aug. 11,519
Cop tubes of paper or like materials. Messrs. Swailes, Oldham.	26th Aug. 11,614
Cleaning and burring foreign sheep skins. A. Granville, London.	26th Aug. 11,620
Dyeing, sizing, washing and wringing hanks of yarn. J. Robertshaw, London.	30th July 10,591
Dobbies for weaving. J. and J. Dawson and J. Clegg, London.	4th Aug. 10,722
Dobbies or shedding machines. J. Knowles and J. Mercer, Blackburn.	6th Aug. 10,795
Dyeing cotton and other vegetable fibres and yarns. J. H. Gartside and J. Barnes, Manchester.	20th Aug. 11,394
Dyeing, scouring, bleaching and otherwise treating yarns in cops. A. Graemiger, London.	23rd Aug. 11,497
Drying wool. W. Nelson and E. Bowen, London.	27th Aug. 11,665
Flexible or adjustable segments for carding engines. J. Tattersall, Pendleton.	9th Aug. 10,891
Finishing Italian cloth and similar fabrics. G. Urbain, Manchester.	11th Aug. 10,977
Grinding flats of carding engines. J. Bullough, Halifax.	24th Aug. 11,507
Healds of looms. C. Hahlo, C. E. Liebreich and T. Hanson, Halifax.	24th Aug. 11,511
Lubricator. John Cashmore, London.	8th Aug. 10,865
Letting-off motion. J. Murgatroyd, Batley.	15th Aug. 11,100
Looms for chenille or fur pile fabrics. M. Corrigan, Glasgow.	17th Aug. 11,235
Lace on twist-lace machines. W. Gadd, Manchester.	29th Aug. 11,687
Opening or separating and cleaning cotton, &c. W. S. Archer, London.	22nd Aug. 11,441
Opening and cleaning cotton, &c. Messrs. Greenhalgh, London.	24th Aug. 11,520
Providing a positive automatic regulator to sectional warping and beaming machines. G. and F. Burgess, and H. D. Ledward, London.	30th July 10,592
Purifying water—the invention being applicable to preventing incrustation in boilers. G. E. Stead and T. W. Duffy, Leeds.	12th Aug. 11,050
Placing cop tubes on spindles. J. B. and G. and J. B. Swailes, London.	13th Aug. 11,081
Preventing "trailings in" in looms. J. C. Cartwright and J. Turner, Huddersfield.	16th Aug. 11,163
Pressing woollen, cotton, linen or felted fabrics. T. Holroyd and B. Thompson, London.	16th Aug. 11,187
Production of grey and coloured yarns. E. and G. E. Sutcliffe, Manchester.	17th Aug. 11,219

Preparation of cotton fibres for dyeing. W. J. S. Grawitz, London.	19th Aug. 11,355
Passing warps into, and receiving them from, dyeing machines and drying cylinders. E. W. Wrigley, London.	22nd Aug. 11,426
Preparing or dressing textile fabrics. H. Martinz, London.	26th Aug. 11,612
Ropes, mats, carpets, and other fabrics from a woolly fibre obtained from wood. W. P. Thompson, Liverpool.	4th Aug. 10,730
Reducing the strain on picking bands and buffer straps in looms. R. Dean, London.	18th Aug. 11,261
Regulating and indicating the production of yarn or doffings in spinning yarns and doubling. H. H. Tankard and H. W. Broadbent, London.	23rd Aug. 11,472
Regulating and controlling the speed of engines. W. F. Brown, Bolton.	27th Aug. 11,631
Shuttle guard apparatus for looms. R. Charnley, London.	30th July 10,599
Spinning and twisting yarns. M. A. Drtina and J. Just, London.	30th July 10,600
Sight-feed lubricators. J. H. Schofield, Oldham, and A. V. G. Worth, Rochdale.	8th Aug. 10,869
Self-acting mechanism for stopping rollers or spindles of spinning, &c., machines. G. H. Holden, Manchester.	9th Aug. 10,889
Splices or joints of leather belting. J. K. Tullis and W. R. Malcolm, Glasgow.	10th Aug. 10,939
Separating silk, cotton, &c., from wool. W. Marriott, Huddersfield.	11th Aug. 10,979
Spinning wool, hair, &c., and machinery. J. J. Delmar, F. E. Tucker and F. How, London.	12th Aug. 11,043
Spinning and twisting wool, cotton, &c. S. B. Barker, Halifax.	15th Aug. 11,101
Spooling machines. J. Halliwell, Manchester.	16th Aug. 11,162
Spinning and doubling. J. Seed, Manchester.	18th Aug. 11,275
Spindles and spindle collar bearings or bolsters for preparing, spinning, doubling, twisting, and winding fibres. W. Sumner, Almelosch.	19th Aug. 11,327
Spindles, and parts in connection therewith, of ring-spinning and like machinery. W. Sellers, Keighley.	20th Aug. 11,375
Self-acting mules. Messrs. France and Smith, Manchester.	25th Aug. 11,558
Separating wool, silk, or other animal from vegetable fibre or other vegetable matter. S. S. Bromhead, London.	25th Aug. 11,570
Steam and other boilers. G. Paxton, Glasgow.	26th Aug. 11,611
Steam engines. J. F. Thompson, London.	26th Aug. 11,617
Stopping looms. F. T. Schmidt, Bradford.	27th Aug. 11,630
Steam engines. W. G. Strype, London.	27th Aug. 11,670
Self-acting mules. W. Dyson and T. Fisher, Halifax.	29th Aug. 11,682
Twisting and doubling yarns. J. Robertshaw, W. H. and F. Shaw, Halifax.	2nd Aug. 10,615
Twisting and doubling. H. Lee, Tipperary.	2nd Aug. 10,625
Treatment of cotton seed for removing fibrous matters, and apparatus therefor. W. H. Stead, Liverpool.	11th Aug. 10,992
Taking-up motion of looms. J. Leeming, Halifax.	12th Aug. 11,017
Tin roller brake apparatus for mules. C. V. Haworth, Manchester.	13th Aug. 11,071
Toothed cylinders for textile machinery, and mode of making. H. Le Grand Moulton and W. H. Clarkson, London.	15th Aug. 11,140
Treatment of textile materials dyed with aniline black. W. J. S. Grawitz, London.	16th Aug. 11,182
Tape warp beaming machines. E. W. Wrigley, London.	22nd Aug. 11,425
Twist-lace fabrics. I. Elliott, London.	26th Aug. 11,615
Upright and other pulleys. W. H. Rooke, Birmingham.	26th Aug. 11,589
Woven belting and looms for weaving same, also means for piecing or uniting the ends of woven belting. H. B. Barlow, Manchester.	3rd Aug. 10,672
Weaving velvets, velveteen, and other west pile fabrics. R. Collinge, Manchester.	3rd Aug. 10,673
West brake for looms, for stopping the loom when the west breaks or is finished. E. Fielden, Manchester.	9th Aug. 10,894
Washing, wringing, and calendering. F. Auspitz, London.	22nd Aug. 11,442
Winding shuttle cops. H. H. Lake, London.	23rd Aug. 11,458
Warp letting-off and treadle motions of looms. C. Catlow, Halifax.	24th Aug. 11,506
Winding yarns to be used as warps. J. Morrison, Glasgow.	25th Aug. 11,550
Winding machines. W. and L. Tolson, and J. Adams, Halifax.	27th Aug. 11,635

Patents Sealed.

2,353	9,579	11,103	5,818	5,960	6,783	9,641	9,671
9,803	10,417	13,125	14,900	1,340	6,004	6,121	5,875
8,939	9,885	864	6,296	10,053	5,299	15,947	9,977
12,507	13,136	6,447	10,176	10,210	10,243	347	721
4,173	6,775	7,366	10,545	15,026	4,769	7,004	7,063
12,975	10,250	10,318	10,542	10,747	386	2,777	7,167
9,478	9,708	10,587	10,588	10,615	10,709	10,718	11,025
11,191	12,761	14,577	1,235	6,666			

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Notices.

The Yearly Subscription—payable in advance—including home postage, is 10s. Cheques and Post Office-Orders to be made payable to H. & R. T. LORD, 10, Ann Place, Little Horton Lane, Bradford, Yorkshire.

The Publishers will be happy to receive intimations of New Inventions, Patents, &c.

The Publishers are open to receive, from Designers, Original Designs of Carpets, Damasks, Tapestries, Linen, Cretonnes, &c., and such as are accepted will be published with the Designer's name affixed. All Designs sent for approval must be 10 inches long by 7 inches wide for single page, and for double page, 16 inches by 10 inches, and must be accompanied by Postage Stamps sufficient to pay return Postage in case they are rejected.

Literary communications must, in all cases, be accompanied by the names and addresses of the writers, not necessarily for publication, but as evidence of authenticity.

Authors are requested to retain copies of their manuscripts; rejected manuscripts cannot be returned.

To prevent any misunderstanding, all Articles sent to the *Journal of Fabrics and Textile Industries* for publication will be considered as offered *gratuitously*, unless it is stated explicitly that remuneration is expected.

Readers are invited to forward items of interest to the Trades concerned.

The Proprietors will feel greatly obliged if any of their readers, in making enquiries of, or opening accounts with, Advertisers in this paper, will kindly mention the *Journal of Fabrics and Textile Industries* as the source from whence they obtained their information.



Association of Chambers of Commerce.

At the autumnal meeting of this Association, held at Exeter, the Chairman, (Mr. Bernard Samuelson, President of the Association), in his opening address congratulated the delegates on the revival in trade, and briefly referred to the Board of Trade returns in support of the foundation of his congratulations. With regard to technical education, he said greater attention ought to be paid to this subject by all classes of manufacturers if they wished to keep pace with competitors. He thought that the association founded under the presidency of Lord Hartington, for the extension of technical instruction, should receive the cordial encouragement of manufacturers and traders, and that special attention should be given to improved commercial education, and that the study of foreign languages should not be considered of secondary importance. As to tribunals of commerce, it was a question upon which there was more general agreement between the chambers than upon any other subject, and a more earnest desire on their part that some definite step should be taken at an early period by the Government. Alluding to the question of railway rates, he said he did not know how this question was to be solved, but his impression was that a representative body of traders should meet a representative body of the railway companies and talk over the matter in a quiet and business-like way. He believed the traders could do something

for the companies, and he was sure that the companies could do much for the traders. The present condition of the railway traffic was wasteful to the community and to the companies, and there was no reason why four trains should start at the same hour between London and Manchester. That was a question which might fairly be discussed between the traders and the companies, and, if it were possible, something like a system approaching to a joint purse should be established with proper safe-guards to the public interests.

TECHNICAL EDUCATION.

The Bristol and Bradford Chambers introduced resolutions to the effect that the association should consider the whole subject of commercial and technical education, and support the Government in any practical legislation that would further this important question; and that local bodies be empowered to establish, maintain, and contribute, to the establishment and maintenance of secondary commercial and technical (including agriculture) schools and colleges.—Mr. Brittain (Sheffield) said that public attention had been drawn to the dangers which threatened us, unless we took up in earnest the question of technical education. The supply of well educated Englishmen was not equal to the demand, and, consequently, educated foreigners held the best positions in our English houses. This is a practical fact that no one could deny.—Mr. Norwood (Newcastle) suggested that technical education was not needed so much amongst the artisan class as amongst foremen and masters, as the British workman is quite equal to the foreigner, hence, it would be advisable to educate only the lads who show exceptional ability, to which the President objected on the ground that the brilliant lads could only be found by giving all classes an opportunity of receiving primary technical instruction. The motion was carried.

COMPANIES' ACT.

The Oldham Chamber moved the following resolution, which was carried:—"That this association regrets that another session of Parliament has passed without any amendment to the Companies Acts, but hopes that Her Majesty's Government will, as promised, take up the subject, and strongly urges them to give the question a foremost place in their proposed legislation for next session."

PARTNERSHIP.

Sir Jacob Behrens (Bradford) moved, and Mr. Fisher (Hull) seconded:—"That the Executive Council, by memorial and deputation, urge the President of the Board of Trade to introduce, into the next session of Parliament, a Bill or Bills, for the consolidation and amendment of the law of partnerships, on the lines of the three Bills prepared by the association, viz.:—the Consolidation Bill, the Limited Partnership Bill, and the Registration of Firms Bill." The motion was carried.

RAILWAY RATES.

Mr. Binns (Worcester) moved:—"That the maximum rates authorised by any Railway Company's Act should include all charges for station accommodation, use of sidings, weighing, checking and labelling goods; that under no circumstances should a lower charge or difference of treatment between different classes of trades be allowed in favour of the foreigner, and to the detriment of native industry." Mr. Leicester (North Staffordshire) seconded the motion, which was carried.

EMPLOYERS' LIABILITY.

Mr. Hall (Derby) moved:—"That the attention of the association having been called to a Bill before Parliament in the last session, 'to amend the Employers' Liability Act, 1880,' which by clause 2 sets aside any mutual agreement between employers and employed, for making provision against loss to a workman, or to those dependent on him, from an accident arising in the course of his occupation, while this association has no desire to nullify, or weaken, the principle of the Act of 1880, that the doctrine of 'common employment' should not be a defence against the claim of a workman for damages suffered on account of injury arising from the fault of the employer or his deputy, it recognises as the most satisfactory mode of providing for such cases the creation of a fund, jointly contributed to by employer and workman, and which the proposal contained in the Bill alluded to, would render nugatory. The association therefore desired the Council to take such means

as they may think best with a view to prevent the adoption by Parliament of any such provision as that referred to, as forming part of the above Bill." Mr. Atkinson (Hull) seconded the motion, which was carried without discussion.

TRIBUNALS OF COMMERCE.

Sir Jacob Behrens (Bradford) moved:—"That, in the opinion of this association, substantial, and, at the same time, cheap and speedy justice in commercial disputes can only be secured by the establishment of tribunals of commerce, such as exist in most other countries. That such tribunals of commerce, whether as separate courts, or connected with the county courts, should always be presided over by a legal judge, assisted by commercial judges. That appeals from such tribunals of commerce be allowed on points of law, but not on the facts so determined. That a memorial, embodying these reasons, be signed by the president on behalf of the association, and presented to the Lord Chancellor." Sir Jacob said the Lord Chancellor had stated that the subject was one well worthy of consideration, and had promised that it should have the favourable and immediate consideration of her Majesty's Government.

MINISTER OF COMMERCE.

Sir Jacob Behrens moved:—"That this association regrets that no step has yet been taken for the creation of a ministry of commerce and agriculture in accordance with resolutions twice passed by the House of Commons; that the Prime Minister be requested and urged, by deputation, to carry out the resolution, and thus meet the unanimous desire of the commercial and industrial classes; that the attention of the large number of representatives of commercial constituencies in the House of Commons be called to the importance of supporting this object, not only by their votes, but also by every influence which they can bring to bear upon her Majesty's Government." Sir Jacob said that the resolution had the approbation of the entire association. The question was not a party one, as two resolutions had been carried by the House of Commons, one by Mr. Lloyd against the Liberal Government, and one at another time by Mr. Monk against a Conservative Government.

FOREIGN AND COLONIAL POSTAGE.

On the motion of the Bristol Chamber, the following resolution was passed:—"That this association resolves to impress on her Majesty's Postmaster-General, by deputation or otherwise, the disadvantage this country suffers in consequence of the existing anomalies of our postal system, which places us in an inferior position for communicating with our colonies and foreign countries to that enjoyed by France and Germany."

POST-OFFICE.

Mr. Plummer (Newcastle) moved:—"That this association is of opinion that the Post-office is looked upon too much as a revenue earning department, whereas, whether as regards the carriage of letters, circulars, newspapers, &c., or the arrangements connected with the telegraph and telephone services, the first duty of the department should be to give the public the greatest reasonable facilities, even if, in some cases, no profit should arise therefrom. That copies of this resolution be sent to the Premier, the Chancellor of the Exchequer, and the Postmaster-General." Mr. Plummer said this resolution, which was a new one to the association, struck at the root of the system on which the Post-office was at present conducted, and which was not only disadvantageous to the public, but was irksome to the Post-office itself. The doctrine that had been laid down that no reforms could be introduced by the Post-office, unless it could be shown that they would pay their way, was a bad one, and opposed to business principles. With a surplus of £2,500,000, they had a right to expect that all reasonable facilities would be granted by the Post-office, which had a monopoly, but owing to the restrictions which were placed upon their action by the Treasury, the department was compelled to act in a niggardly spirit, and, as representatives of the commercial community, it was time that they made efforts to obtain the removal of those restrictions. Mr. Simpson (Hull) seconded the resolution, which was carried unanimously.

An invention has been brought out for rendering ordinary cloth water-proof without being air-proof, this has been introduced to the consideration of the Government, who have decided to have material for soldiers' and sailors' clothing submitted to this process.

Bradford Trade with the United States.

A decline in the American exports has been ascribed as one of the principal causes of that depression in the Bradford trade, which every market man apparently accepts unquestioningly as one of his articles of faith, but, from the published returns, the premises, upon which the argument is founded, appear to be of a not very substantial character. It is true there has been a falling off in the total value of exports as compared with last year, which was, with one exception, the heaviest in value, and very much the heaviest in volume, in the whole history of the borough, but so far from being a cause of grief, it is in some respects the reverse. The diminution has been mainly in the export of raw materials, wool, noils, and waste, and in the partly manufactured goods, such as yarn. It is a self-evident fact, that it is better that the raw material should be manufactured here, rather than be exported to be manufactured abroad. At first sight, the total exports for this year, as compared with last, are anything but reassuring, but their importance is considerably modified, when the fact that we have stated is kept in view. For the first quarter of 1886, the exports reached £980,314; this year they were £823,792; in the second quarter they were £860,867, as against £762,689 this year; and in the third quarter £969,499, as against £973,324 in the quarter just ended. Last year's returns were considerably swollen by the rush made by American manufacturers into the worsted coating business. This necessitated the import of an enormous quantity of specie yarns. The thing was overdone, and not only so, but English made worsteds continued to maintain their hold on the market. Consequently, the American makers were left with a glut of the manufactured goods and yarn, which in some cases they have not been able to get rid of, and this has continued to exercise a depressing effect in the trade during the present year. To this fact is due, in great measure, the diminution of the yarn exports, and this is also the secret of the clamorous demand now made by the manufacturers in the States for a prohibitory duty to be placed on worsted coatings. Strong pressure has been brought to bear on the Secretary of State to effect a change in the levying of the duties adverse to exporters here, and the makers have threatened that, unless their demands are granted, 100,000 hands will have to be thrown out of work; but we are informed that the Secretary is unshaken in his determination to maintain the *status quo*, and, therefore, local merchants need scarcely be under apprehension on that point. It is of interest to compare the returns for the different months this year with the corresponding months of 1886 in the main textiles with which Bradford is identified, and in doing so, it must be borne in mind that, although in one year, 1872, the value of the exports was greater than that of last year, the volume of exports in 1886 was infinitely greater than that of any preceding year in the history of the trade. The value of the exports in 1872 was £3,760,889, last year, £3,673,665; but, in 1872, wool was selling at 23d. per lb., and all manufactured goods were proportionately dear, whilst last year wool was about 9d., and textiles proportionately cheap. There was, consequently, something like three times the trade done with the States last year compared with the best year in point of value which preceded it. Prices are even lower this year than last, and, therefore, the comparison of the figures of the two years is even more significant. The diminution in the figures for wool and yarns is very great, and there is a proportionate fall in noils and waste. In January, yarns fell from £42,000, the figure for 1886, to £11,000; in February, the drop was from £40,000 to £11,000; in March, from £43,000 to £15,000; in April, from £35,000 to £6,000; in May, from £16,300 to £7,900; in June and July, the difference was not so marked; but in August, export fell from £21,800 to £12,200; and last month, from £18,200 to £15,300. The falling off in wool during the last quarter has been very large; the exports in July being £27,000, against £76,000; and in August £30,400, against £56,800. Last month, there was a very decided increase in the export of worsted coatings, the value being £79,440, against £56,148 last year. The coatings exported, we may mention, are almost entirely under 4s. 6d. the yard; and as instancing the benefits of protection to the consumer, we may add they cost, on the other side of the Atlantic, about double the price they are sold at here. In August, coatings to the

value of £56,500 were exported; nearly the same as last year, when the figure was £59,300; in July, the figures were £51,400 and £57,900; in June, £52,600 and £68,000; in May, £52,900 and £70,000; in April, £59,700 and £75,600; in March, £48,500 and £54,500; in February, £40,000 and £66,000; and in January, £52,000 and £94,000. It is a matter of regret that, up to last month, the returns should have shown a continued falling off in this department; but it is explainable on the grounds we have mentioned, and the substantial increase on the September figures is an encouraging sign whether it be regarded as indicative of the fact that the old stocks in the States have at last been worked off, or that there is an increasing demand for coatings of Bradford manufacture. In the miscellaneous Bradford goods classed under the generic name of "stuffs," there is a steady, though not a very serious, reduction during all the year, from January until September is reached, when the figures bound up from £116,500 to £125,300. We are afraid that unless there is some sudden change of fashion, or local makers learn to turn out bieses and cashmeres, and other fine descriptions of goods, able to hold their own as to price and quality with Continental makes, there is not much prospect of last year's record in "stuffs" being beaten in a hurry. The exports were in January, £153,000 against £142,000 last year; February, £111,000, against £116,000; March, £104,295, against £132,400; April, £80,700, against £109,300; May, £86,900, against £113,600; June, £99,100, against £135,200; July, £123,000, against £122,700; August, £118,100, against £131,800; and September, as we have already stated, £125,300, against £116,500. Amidst many figures that either tell to some extent against Bradford, or indicate that the trade is stationary, it is pleasing to note the growing importance of our trade with the States in silk goods, plushes, &c. In January, the exports increased from £11,000 to £13,000; in February, there was a drop to £15,000 from £19,000; March, an increase from £15,000 to £23,900; in April, the figures for the two years stand nearly the same, at about £25,000; May, a rise from £21,700 to £32,500; June, £33,200, against £30,400; July, £38,000, against £26,900; August, £36,700, against £24,400; and September, £31,800, against £28,100. These figures do not represent the whole of the trade done by Bradford with the States in these goods, they merely serve to give an approximate idea of the rate at which the trade is increasing. Very large quantities of silk goods made in Bradford are declared through the Manchester consulate. Messrs. A. and S. Henry do all their large silk export trade from their Manchester house; and other big customers for Bradford silks also send from Cottonopolis. Altogether, although there is nothing to be specially jubilant about in regard to this year's exports, there is, on the other hand, no cause for being unduly cast down. So far for the nine months, the returns come very near the total of last year, which was the very best in point of volume the American trade has experienced. What falling off there is, is very largely accounted for by the lessened demand of American manufacturers for raw material, and this is tantamount to an admission that their comparative lack of skill and wasteful management, more than counterbalance the advantage they derive from a very heavy tariff.

Pattern and Sample Post.

OUR LAST MONTH'S ISSUE.

Many of our readers were, last month, subjected to the payment of an extra postage, the reason assigned by the postal authorities being the "enclosure of prohibited matter in our Journal." It would probably be a puzzle to many to find where we were wrong. The error consisted in our having a sheet of cloth patterns, corresponding with the designs given on page 31, and patterns of novelties in fabrics manufactured by one of our subscribers, Mr. David Madeley, of Manchester and Royton. Hitherto our Journal has come under the Book Post Regulations, the postage per copy being 2d., and we find that, by enclosing the sheet named, we at once converted it into a letter, at a postage of 3d., whilst if the Journal and sheet are sent separately the postage amounts to 2½d. These are the Inland Postal Regulations, which impose a higher rate upon a copy posted to

our next door neighbour than if sent to a country thousands of miles away. Where the wisdom of such incongruous regulations is to be found has been a puzzle to those who have agitated for the introduction of a Pattern Post, which has at last been conceded, and is now in operation. We have had a correspondence with the Postmaster General, the result of which is that, although the Journal containing these patterns may not be transmitted by book post, the patterns and Journal may be forwarded by pattern post, although in each case the postage is the same. This decision, however, came too late to enable us to issue cloth patterns along with our designs in this number. We shall, therefore, give an increased number of samples in November and December for the benefit of those subscribing to the supplement. We draw the matter before the notice of our readers in order that they may know how the case stands, and that therefore they will not be subjected to further annoyance. We are looking forward to the time when Journals published monthly will be placed upon an equal footing with those issued weekly. Granted this concession, the difference to us in postage would be 1½d. per copy. Where is the wisdom of the present regulations, and where the fairness? By the Inland Pattern and Sample Post, commenced on the 1st inst, trade patterns and samples may be sent in the United Kingdom under the following regulations and rates of postage:—

For a packet weighing not more than 4 ozs., 1d.; for a packet weighing more than 4 ozs. but not more than 6 ozs., 1½d.; for a packet weighing more than 6 ozs. but not more than 8 ozs., 2d. No packet must exceed 8 ozs. in weight. The limits of dimensions are 12 ins. by 8 ins. by 4 ins. If either of these conditions be infringed, the packet will not be forwarded, but will be returned to the sender. If a packet be posted wholly unpaid, it will, on delivery, be chargeable with double postage: a packet posted insufficiently paid will be chargeable with double the deficient postage. The Postmaster General wishes it to be clearly understood that the Post is expressly intended for the benefit of, and is absolutely restricted to, *bona fide trade patterns and samples of merchandise*. No article sent for sale, or in execution of an order (however small the quantity), or sent from one private individual to another, will, under any circumstances, be admissible; and if any such packet be posted prepaid at the pattern-rate only, it will be charged with double the deficient postage, *at the letter-rate*, together with a fine of 6d. Patterns and samples must be sent in wrappers (marked "Pattern Post" or "Sample Post") entirely open at both ends, and must be so packed that they may, to the satisfaction of the Postmaster General or his officers, be easily withdrawn for examination; but samples of seeds, flour, drugs, and such like articles, which cannot be sent in open wrappers, may be enclosed in boxes (but in such a way as to admit of easy examination) or in bags of linen or other like material, tied at the neck. Closed bags, even if transparent, will not be allowed. In all cases where the requirements in regard to the mode of enclosure are not complied with, the packet will be returned to the sender. It is obligatory that the name, address, and trade of the sender be in all cases *printed* on the outside of the wrapper, above the address. If this rule be not complied with, the packet will be liable to the penalty referred to in Clause 4. The number, price, and private business marks, may (as well as the address) be in writing; but no other writing will be allowed. In case of the infringement of this rule, the packet will be surcharged at the letter-rate. No glass bottle, nor glass in any form, may be sent; no explosive, liquid, semi-liquid, nor greasy matter, nor powders of any kind which may stain or do other damage; nor any living creature. Patterns of scissors, knives, razors, and other sharp articles, must be so packed and guarded as to completely prevent injury to the other contents of the mail bags, or to the officers employed, but the packets must at the same time admit of easy examination. When these requirements are not complied with, the packet will be stopped. When necessary for securing the due transmission, or delivery, of letters, patterns and samples may be kept back for the succeeding despatch or delivery.

Parcel Post to Italy (via France).

As already notified parcels not exceeding 7lb. in weight, will now be received at any Post Office in the United Kingdom for transmission to Italy, including Assab and Massawah, via France. Latest hours of posting:—

IN LONDON.	For Night Mails.		For Day Mails of next day.	
General Post Office.....	5.0 p.m.	.....	10.0 p.m.	Every Week Day.
Town Districts.....	1.0 p.m.	.....	7.0 p.m.	
Suburban Districts.....	11.0 a.m.	.....	4.30 p.m.	
IN THE COUNTRY.		{ In time to reach London by 2.0 p.m.		{ In time to reach London by 10.0 p.m.

Parcels addressed to Italy, and intended to be forwarded via France, will be made up in London in closed mails, and will not

be subject to examination for Custom purposes, or otherwise, before reaching the Italian Office of Exchange. Postage for a parcel not exceeding 7lb., 2s. 1d. The general regulations of the Foreign and Colonial Parcel Post must be observed in the case of parcels for Italy sent via France, as in the case of the parcels which may still be sent, though a higher rate of postage, in the ordinary parcel mail to Germany.



Fashions in Worsted and Woollen Cloths for Winter Season, 1888-9.

During the past few months, the improvements made in the production of worsteds and woollens in respect to design, colouring and finish, have been again a decided advance on the cloths of former seasons, but in new weaves little has been done, as it seems almost impossible to produce anything really novel and distinct from those of former years, but in new effects, produced by changes and varieties of colourings, and by the combination of various plain and fancy yarns, manufacturers of fancy fabrics in worsted, woollen and mixed yarns, may congratulate themselves on the admirable productions they have recently put upon the market. In the patterns for spring and summer, of 1888, effective materials have been placed before merchants, and a good trade is expected during the next few months in these goods, and manufacturers of the best and medium classes of cloths are now turning their attention to the patterns for the winter of 1888-9. In worsteds, more subdued effects in colouring will be the rule, and silk yarns will be used more sparingly. In coatings, the tendency is to checks, both in large and small patterns, dark shades of yarns being the most predominant, with, in a majority of cases, speckled silk effects, produced by the use of very fine counts of yarn. The coarser makes will be utilised both for ladies' and gentlemen's wear. In many cases, a large overcheck, forming raised ribs on the fabric, will be in vogue, but the leading characteristic of worsteds generally will be a smooth surface. Worsteds, having fancy yarns, of the curled or knopped character, are expected to be made for gentlemen's coatings, but without partaking of the rough surface that has already been the fashion. In trouserings, the tendency is to stripe effects, many of which have the latter in broad raised ribs of dark shades, such as black, brown, dark blue, &c., whilst the body is of lighter colours, with silk stripes in distinct shades running between the raised ribs. Other stripes will be formed on plain black fabrics by speckled silk, the latter giving stripes from $\frac{1}{8}$ to $\frac{1}{4}$ inch wide, and the former $\frac{1}{16}$ to $\frac{1}{8}$ inch wide. In coatings and trouserings, as well as in suitings, in which silk is not used, prominent effects are got either by distinct colourings, or by brighter yarns than those used in the main portion of the fabric. The above give the leading features of patterns for the worsted branch of fabrics for gentlemen's wear, although additions may be made as the seasons advance. In tweeds, cheviots, and such like woollen goods, the tendency is to less brilliant colourings, and, in the former, efforts will be made to run draw-finished cloth, made in the finer qualities of coloured yarns. In suitings, we may say that, providing one colouring is not much more prominent than another in the patterns, producers will use almost any designs. Checks for suitings and coatings, and stripes for trouserings, in fine, medium, and low descriptions of fabrics, and in large and small effects will take the lead. Cloth in large checks, and of the heavier makes, especially in Scotch productions, will be utilised as suitings and also for ladies' mantlings. In overcoatings, we quote from a contemporary. The chief thing for a manufacturer to remember is that, no matter what materials are employed, the maximum of

warmth with the minimum of weight must be his first consideration. To attain this end, no special materials are employed. Everything is used, carded, combed, cachemire, alpaca, cheviot, mohair, &c. The crossings and finishings must be so arranged as to impart to the stuff the required qualities. The twisting of the threads must be rather open because of the elasticity desired, which must be, not only preserved but, increased in the finishing. The samples that are combed on the right side will always be worked. The first shadings in the charming mixtures of this thin and agreeable thread will be chosen from the prettiest of the dark tints or colours, which are generally preferred for the winter. The new designs must be rather small than large, accented, while at the same time they are of long twisted threads, in order to avoid their being stiff. The wrong side is not considered so important as formerly; however, it is still necessary, as it greatly adds to the elegance of the stuff. After a small modicum of melting, which is done in order to strengthen the consistency of the cloth, if the other operations of finishings are properly conducted, the back is beautifully soft and agreeable to the touch; when a strong pressure is indispensable, in order to unite the surface, it must always be done by a steam jet, which will raise and separate the threads, and render the tissue supple and elastic. Last winter, we said that the wrong sides should be worked, and that both sides should be alike, &c.; now, the best goods will have the back worked with Scotch designs, as the double faces, except, of course, some minor modifications. These backs are generally made for two purposes. They should take the place of the lining of the garment, and they should augment the elegance of the tissue, and facilitate the sale by giving it a more refined appearance. This finish must not be neglected, as it requires a proper design, and agreeable tints, which must be carefully matched. In short, the back must be better in proportion as the right side is richer. We have, as usual, a stock of patterns for the winter seasons of 1888-9, in worsted and woollens, comprising French and English samples, and selections of these will be forwarded to manufacturers, carriage paid, on receipt of £2, per 100 patterns. In ordering, it is requested that a few clippings of the class of cloths specially required should be sent to us, and we are then better able to select patterns most suitable for purchasers.

An Improved Yarn for Healds, Harness Threads, &c.

In the manufacture of goods, in which the yarns have a propensity for "cutting" and "breaking" the healds, jacquard threads, &c., producers have often to run the risk of pecuniary losses from this cause. And although, until recently, the efforts made to counteract entirely the chafing effect of warps upon such like appliances have not been perfectly successful, still, during recent years, improvements that have worked fairly well have been made in the production of yarns specially adapted for this and similar purposes. These have been spun of admixtures of fibres supposed to withstand in a greater or lesser degree any chafing action. Recently, an invention for the above purpose has been the subject of a patent. The yarn is a combination of the fibre known as "China Grass," "Ramie Fibre," &c., with some other fibre. This is combined and blended by gilling slivers of it with slivers of Lincoln, Leicester, and such like wools, after which operation the mixture is spun, or twisted and doubled, into yarns. The fibres are employed, generally, in the making of the yarns, in about equal proportions, but this is regulated according to the requirements of the work to be done. The combination is not limited to the two fibres above named, as silk, cotton, hemp, flax, or other vegetable or animal fibres can be employed with the "China Grass." It is claimed that the different combinations render the yarns eminently fitted to cope with the difficulties experienced by manufacturers in the continual breaking down of healds, doup and harness threads, which often, in certain classes of work, entail a great amount of anxiety, and loss of time and money. In addition to being specially adapted to the purposes already named, the yarns can be utilised for warp and weft in the making of fabrics.



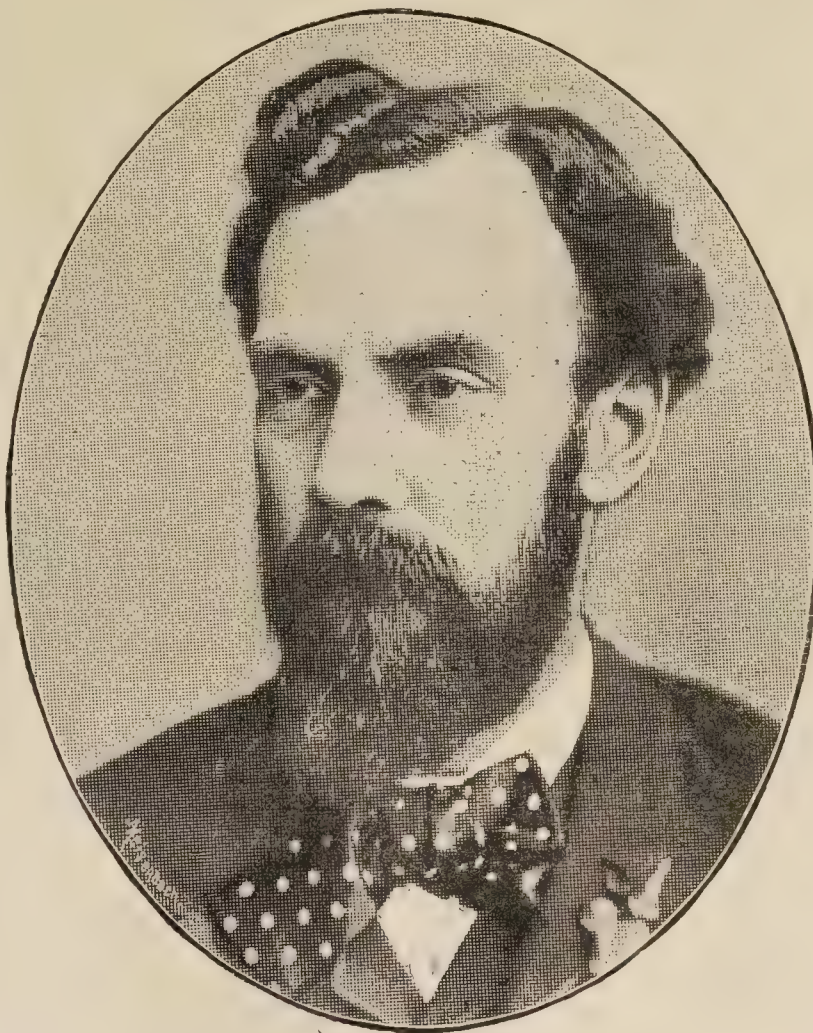
Samuel Lee Bapty, Esquire.

Now that the Manchester Exhibition is drawing towards its close, a few words upon its general manager may not be out of place in our pages. Mr. Samuel Lee Bapty, whose portrait we give, appears to be a gentleman born with a special faculty for filling such a position as the one he has occupied as general manager of the Manchester Exhibition with such marked success, and we feel sure that the exhibitors will not fail to give expression to their sense of the courtesy and kindly feeling which he has shown in all matters connected with their interests. This is not, by many, the first exhibition which Mr. Bapty has piloted to a successful issue. His first experience was gained in connection with those instituted by the Royal Dublin Society in 1861 and in 1864, and the Dublin International of 1865 again found him at his post. At the Naval and Sub-Marine exhibition in London in 1882, he had the entire management of the exhibits, catalogues, &c., whilst his assistance at the Engineering and Metal Trades Exhibition in London in 1883 gained for him unqualified praise. With regard to his management of the Liverpool Exhibition, held last year, much might be said, but it is sufficient to show the appreciation in which his services were held to state that a banquet was given in his honour, and a very substantial testimonial was presented to him by a large number of subscribers. That his selection as general manager of the Manchester Exhibition by a unanimous vote from a large number of candidates was a wise choice is abundantly shown by the result, and Manchester may, therefore, be congratulated upon securing the services of a man so thoroughly competent to fulfil such an undertaking. Mr. Bapty, whose portrait we give, was born in Leeds in 1847. He received his education at the school of the Mechanics' Institution in that town, his father, Mr. Frederic Bapty, being one of its life members. Here he distinguished himself in examinations held in connection with the Oxford and Durham Universities, and, upon one occasion, when the late Lord Palmerston presented the prizes, Mr. Bapty and his two younger brothers made their mark by carrying off most of the first-class prizes. Upon leaving Manchester, he will enter upon a fresh field of management, as, we understand, he has been appointed by the Belgian Government General Commissioner for the English section at the Brussels Exhibition to be held next year, in which enterprize we are quite sure all friends will join in wishing him every success.

Lighting in Works and Factories.

Professor J. A. Fleming, M.A., D.Sc., professor of electrical technology in the University College, London, in a paper, invites attention to the subject of electric lighting in works and factories. Dealing first with the question of cost and durability, he said that in nothing was the progress of five years more remarkable than in the great reduction of weight, bulk, and cost of dynamo machines, considered with respect to their transforming power. In regard to lamps, the choice now lay between the true arc-light and pure incandescence. Very lately, incandescence lamps of high candle-power had come to the front, and he thought we might look forward with confidence to incandescence lamps of actual 1,000 candle-power having a considerable future and a prac-

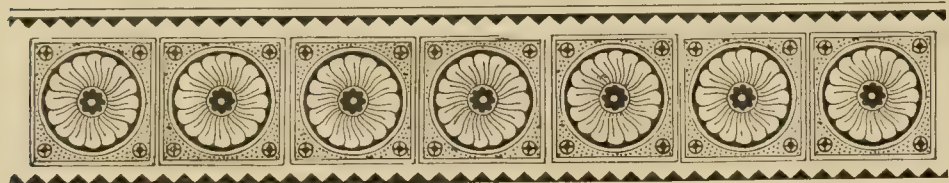
tical use. The incandescence light, however, was too rich in orange and yellow rays to be a full substitute for daylight, and it was greatly inferior to the arc in actinic or chemical rays. Whatever might be the sanitary or incidental advantages of electric lighting, there was one essential condition of its adoption, namely, that it must benefit the pocket of the user on the whole, because the advantage came sometimes, not merely in the bare comparison with the gas bill, but in the longer hours and better work, or the reduced fire-risk possible. Take the case first of flour mills. They knew well the explosive character of an atmosphere laden with flour-dust. The use of the incandescent electric lamp might certainly be said to provide a security from dust explosion not attainable when gas is used. A flour-mill, of moderate size, with, say, 16 sets of rolls, requiring about 80 16-candle-power lamps, could be provided with incandescent lighting for about £230. Allowing the incandescence lamps an average life of 1,000 hours, and, taking coal at 10s. per ton, and depreciation at 10 per cent., the evidence of users showed that such light was more economical in cost than equivalent gas-lighting, by gas, at 3s. per thousand, taking the lighting hours at 3,000 per annum. Another large group of mills, in which electric lighting was equally satisfactory, were cotton mills; and he mentioned, as a typical case, the extensive cotton mills of Messrs. Rhodes and Sons, at Hadfield, near Manchester, which contained 73,566 spindles, and 1,300 looms, and were lighted by 1,500 incandescent lamps, in place of 2,000 gas-jets, formerly employed. There was less sickness in the mill than before, and this was



attributed, to a great extent, to a purer atmosphere. An interesting, and, at the same time a successful and instructive application of electric lighting to industrial works was found in the large sugar-works of Messrs. Henry Tait and Sons, near London. He next directed attention to some cases in which the motive for employment of the light had been rather its intrinsic value than its relative cost as compared with gas, mentioning amongst others the extensive mills of Messrs. S. C. Lister and Co., Manningham, Bradford, which had, for some time, been lit with a large arc-lighting plant, the lamp used being the Pilsen Arc Lamp. The departments in which the arc-lights had practically replaced gas were those in which the manufacture and examination of velvets, plush, and imitation sealskin were carried on. In nearly all the rooms devoted to this purpose, it had formerly been impossible to work after dark. With the arc-light, the work could be carried on at night, or on the duller days, it being found possible to strike the nicest shades of colours, or to match the most delicate pattern by its aid. In every case in which the ordinary factory motive power could be drawn upon for the dynamo directly, without the necessity for a special engine, or attendant, the arc-light, as an illuminant, specially asserted its economical superiority over gas, and, in other cases, it enabled work to be carried on which could not so be done by gas at all. Incandescence lamps of high candle-

power (500 to 1,000) might probably come in time to compete seriously with ordinary types of arc-lamp. If the high candle-power incandescence lamps could be supplied to users at a price sufficiently moderate, and with an average duration equal to that of the ordinary 16 or 20 candle-power lamp, it was evident that its inferior efficiency would be compensated for by the absence of working expense other than that for power. The much greater facility in handling and moving from place to place, would give the high candle-power incandescence lamp another advantage. One of the great incidental advantages which the incandescent light possessed as an illuminant in workshops was that it could be suspended over lathes or tools, or in machines, in positions in which gas could not well be used, or would be dangerous. Regarding the whole question of the electric illumination of mills, works, and factories, it was with considerable confidence that he made the statement that the more closely its advantages and merits were inquired into, the more forcible they would seem, even in the face of the fact that gas in the United Kingdom had a lower average price than in any other portion of the world.

The Orient Steam Navigation Company having arranged that their vessels shall call at King George's Sound on each alternate voyage on their way to Adelaide, advantage will be taken of these opportunities to despatch extra mails to Western Australia, *via* Brindisi, for embarkation with other mails for Australia, on board the Company's vessels at Suez. The following are the dates on which these extra mails will be made up in London during the present year:—21st October, 18th November, and 16th December, 1887.



ORIGINAL DESIGNS.

On our first plate is a design for a Linen Table Napkin, drawn expressly for us by Mr. C. W. Sandiforth, 103, Race-common Road, Barnsley.

* * * *

On our second, we give a pattern for Tapestry Fabric, drawn by Mr. F. Layton, York Terrace, Akroydon, Halifax.

* * * *

On our third plate is a design for Worsted Damask, the work of Mr. George Holden, Chester Road, Akroydon, Halifax.



MONTHLY TRADE REPORTS.

Wool.—At the London wool sales there has been an average quantity of material sold, the Continental dealers and spinners having purchased largely. The catalogues have comprised several large lots of good wools, and these have generally brought corresponding prices. For crossbreds, a fair demand has ruled, and average prices have prevailed. In the Yorkshire and Scotch wool markets, sales have mostly been for present requirements, with but little speculation, but sufficient business seems to have been done to keep rates moderately firm during the month. The yarn trade has been rather quieter, the orders coming to hand being small in quantity, and the prices generally offered being such as spinners have been indisposed to accept, when the firm rates for wool are taken into consideration. Production has been curtailed during the month. The piece branch has slightly improved, both for home and export demand, the worsted coating trade for America has shown signs of improvement, and a steady demand for that country is shortly expected. In the dress goods trade, a decided change has taken place in the class of fabric selling; for some time past, the run has been on plain goods, now, the principal inquiries are more or less in the direction of figured fabrics.

Cotton.—The sales of raw material have been of a fluctuating character, with about an average demand for the month, but, towards the close, the market was rather unsettled, prices showing a downward tendency. In the yarn trade, buyers generally have purchased to cover actual requirements only, and there has been an absence of speculation. Some spinners are fairly situated, having orders on hand, and these refuse new business unless at improved prices. Weft spinners are less favourably employed than makers of twist, as large stocks are still on hand, and this fact militates against unremunerative prices for weft yarns. The cloth branches have had fair inquiries, and, on the whole, the markets have been steady up to the present time, and, generally, manufacturers have held out for firm rates, but still there is considerable room for improvement in this branch.

Woollen.—Trade has only been slow during the past month, but there are indications of improvement, and manufacturers have hopes of a good business being done during the coming season and are preparing themselves for it. The turnover of the better class goods has not been quite so large as usual, but, as new patterns are being got ready, the usual volume of orders is shortly expected. The tweed and cheviot trades have been fair, and for the clothing departments many inquiries have already been made, but actual business in new goods has not been large in volume, still, as in other branches, a fair demand is hoped for. The inquiries made have been chiefly for tweeds,

unions, meltons, presidents, and such like goods, in medium and low qualities. The shipping branches, especially for the Spanish, Italian, American, and Australian markets, have considerably improved, and there has also been a better demand for the Cape and the Continent. Full time is generally worked, and, in many cases, overtime is the rule, still there are a few firms who are working short time.

Linen.—In this trade, there is nothing particular to note. In some branches, as in damasks, toilet and domestic cloths, there is a slight improvement, with rather better prices, whilst, in others, business has not improved in any perceptible degree. The jute trade has been flatter, the foreign competition still being as keen as during the past two or three years. In Germany, spinners and manufacturers have decided to reduce the prices of their production by 2 per cent., and this fact, following upon the recent fall of rates in this country, puts producers here in an unsatisfactory position. Prices offered have been mostly below those current a month ago, but sellers have appeared indisposed to accept any reduction on the recent prevailing rates, and, in consequence, little business has been done, and stocks are beginning to accumulate at a rather unpleasant rate for the producer.

Lace.—Business still remains in a languid condition in most departments; and although things looked a shade brighter a few weeks ago, still the hoped-for improvement does not come. Spinners of lace yarns are, perhaps, in a slightly better position than was the case a short time ago, but the manufactured article brings such unremunerative rates that it affects the yarn branch adversely. The curtain trade is of a hand-to-mouth character, and many machines are still idle, with no immediate prospect of employment. The fancy lace branches have also been quiet, except for productions of an entirely new character. Prices for most goods have shown a weakening tendency.

A Proposed Export Exchange.

A project is on foot for the establishment of an Export Exchange in the City, where buyers can meet with sellers, and where manufacturers may exhibit goods suitable for foreign markets. This will afford great advantages to both foreign buyers and English manufacturers. In the proposed Exchange, arrangements are to be made for about 300 sale stalls, in addition to which there are to be various conveniences, such as reading and writing rooms, &c. Interpreters will be constantly at hand, and all possible information as to the shipment of goods, tariffs, &c., will be promptly obtainable. If this scheme be successfully carried out, the Imperial Institute will be forestalled in one of its chief objects, namely, the necessity of affording facilities such as those which the proposed Export Exchange will give. This scheme will tend to lessen the value of the Imperial Institute in public estimation, the site of which is, perhaps, the most inconvenient one that could have been chosen. Kensington, as has been often urged, is too far away from the City, hence the Imperial Institute will fail in affording practical benefit to busy business men. There should, therefore, be no difficulty in the way of a successful realisation of the present project.

It is stated that all goods sent to the exhibition to be held at Teheran (Persia), and not sold, will be returned to the exhibitors, and Messrs. Kenschin also promise to advise intending exhibitors how they may best adapt their productions to the taste of the Persian public. It must, however, be remembered that goods can only be exhibited through Russian middlemen.

The idea of forming a purely Italian Exhibition next year in London is rapidly gaining ground in England, as well as in Italy. It is supposed that it will be opened on the site of the present American Exhibition, the buildings of which will be used on this occasion; and let us hope that the show will be much superior to that made in the American Exhibition. Many of the merchants of Italy are willing to co-operate, and to make the venture as successful as possible. It is likely to do a great deal of good to that country in commerce, as it will show England the importance of Italy apart from its artistic renown.



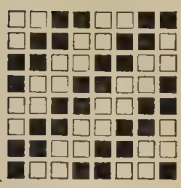
LINEN TABLE NAPKIN.

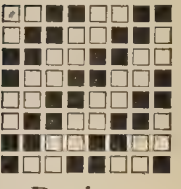






Suitings.

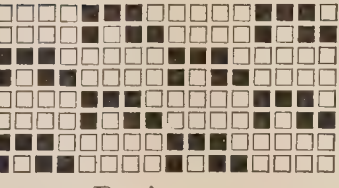
No. 481.	Warp :—	
	4 ends White Cheviot 2/30's woollen.	
	2 „ Black and White „	
	2 „ White „	
	1 end Black and White „	
	1 „ White „	
	1 „ Black and White „	
	1 „ White „	
	1 „ Red, 20 skeins single.	
	5 ends Black and White 2/30's.	
	6 „ White „	
	4 „ Black and White „	
Design.		
Straight Draft.		
	28	
	Weft :—	
	5 picks Black and Drab 2/30's woollen.	
	6 „ Black, 15's single.	
	4 „ Black and Drab 2/30's.	1984 ends in warp ;
	4 „ Black, 15's single.	32 ends per inch ; 32
	2 „ Black and Drab 2/30's.	picks per inch ; 16's
	2 „ Black, 15's single.	slay ; 2 ends in a reed ;
	1 pick Black and Drab 2/30's.	62 inches wide in the
	1 „ Black, 15's single.	loom ; 56 inches wide
	1 „ Black and Drab 2/30's.	when finished.
	1 „ Black, 15's single.	
	1 „ Fancy thread.	Weight 16 ozs.
	28	

No. 482.	2,128 ends in warp.	
	34 „ per inch.	
	34 picks „	
	17's slay.	
	2 ends in a reed.	
	62 inches wide in the loom.	
	56 „ when finished.	
Design.		
	Weight 22 ozs.	Straight Draft.

Warp :—	
2 ends Brown 20 skeins, twisted to 40 skeins White	} 3 times.
1 end Green, 14 skeins.	
2 ends Black and Olive, „ „	
3 „ Black, 14 skeins.	} Once.
2 ends Brown and White „ „	
1 end Green.	
2 ends Black and Olive „ „	} Once.
15 „ Black, 14 skeins.	

Weft :—	
2 picks Black and White, twisted to 40 skeins White	} 3 times.
1 pick Crimson, 14 skeins.	
2 picks Olive and White, „ „	
3 „ Black, 14 skeins.	} Once.
2 „ Black and White, „ „	
1 pick Crimson, 14 skeins.	
2 picks Olive and White, „ „	} Once.
15 „ Black, 14 skeins.	

Worsted Suiting.

No. 483.	7,168 ends in warp.	
	112 „ per inch.	
	56 picks „	
	14's slay.	
	8 ends in a reed.	
	64 inches wide in the loom.	
	56 „ when finished.	
Design.		
	Straight Draft.	Weight 16 ozs.

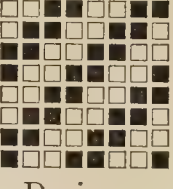
Warp :—

1 end Black 2/48's worsted, twisted to Lavender silk	} 8 times.
1 „ Black 2/36's „ „ „	
1 „ Maroon 2/48's „ „ „	} 8 times.
1 „ Maroon 2/36's „ „ „	
1 „ Black 2/48's „ „ „	} 8 times.
1 „ Black 2/36's „ „ „	
1 „ Brown 2/48's „ „ „	} 8 times.
1 „ Brown 2/36's „ „ „	

Weft :—

8 picks Smoke single 30's, twisted to Lavender.	
8 „ Olive „ „	Orange.
8 „ Smoke „ „	Lavender.
8 „ Brown „ „	Orange

Mantle Cloth.

No 484.	2,560 ends.
	40 „ per inch.
	40 picks „
	20's slay.
	2 ends in a reed.
	64 inches wide in the loom.
	56 „ when finished.
Design.	
	Straight Draft.

Warp :—

9 ends Drab Mixture, 20 skeins.	
1 end Tan and White 2/8's woollen.	
1 „ Brown and White twist, 2/40's woollen, with Red overtwist.	
10 ends Brown and White „ „	
1 end Brown and White „ „	
12 ends Drab Mixture, 20 skeins.	
1 end Brown and White, 2/40's „ „	
10 ends Brown and White „ „	
1 end Brown and White „ „	

Weft :—

1 pick Black and White, 2/40's woollen, with Canary overtwist.	
12 picks Black and White „ „	
1 pick Black and White „ „ „ „	
11 picks Drab Mixture, 20 skeins.	
1 pick Tan and Drab 2/8's woollen.	
1 „ Black and White 2/40's „ „	
12 picks Black and White „ „	
1 pick Black and White „ „ „ „	
16 picks Drab Mixture, 20 skeins.	

Machinery imported into Austria now pays only one-half the previous duty. During the past three months, 936 machines have been imported into the country at the reduced rates, of which England has supplied the greatest number (66.5), consisting chiefly of machinery for the manufacture of cotton and linen; Germany occupies the second place, and sends (21.9) spinning and auxiliary machines, looms for weaving woollen goods, and mechanisms for hat, sugar, and paper making; Switzerland stands next (10.4), supplying embroidery machines, silk looms, and cotton spinning machines; and all other countries together send 12 per cent. of the whole importation.

The Pyromagnetic Dynamo.*

By THOMAS A. EDISON.

The production of electricity directly from coal, is a problem which has occupied the closest attention of the ablest inventors for many years. Could the enormous energy latent in coal be made to appear as electric energy, by means of a simple transforming apparatus which accomplishes its results with reasonable economy, it will be conceded probably that the mechanical methods of the entire world would be revolutionised thereby, and that another of those grand steps of progress would be taken, of which the nineteenth century so justly boasts. The simple production of a potential difference by means of heat, is as old as Seebeck and Melloni. The science of thermo-electricity thus originated has been developed by Becquerel, by Peltier, by Thomson, and by Tait, and the thermo-batteries of Clamond and of Noe have found many important practical uses. The results already attained in these generators have stimulated research

* Abstract of paper read before the American Association for the Advancement of Science, New York, August, 1887.

marvellously, and many investigators have believed that in this direction lay the philosopher's stone. Our fellow member, Moses G. Farmer, worked long and assiduously in this field, producing, it is believed, the most satisfactory results as regards economy which have ever been obtained. But even these results were not very encouraging. He never succeeded in converting one per cent. of the energy of the coal into electric energy. Quite recently, Lord Rayleigh has discussed, with his well-known ability, the law of efficiency of the thermo-battery from the standpoint of the second law of thermo-dynamics; and he concludes that, for a copper-iron couple working between the extreme limits of temperature possible for these metals, a conversion of not more than one three-hundredth part of the coal energy can be hoped for. While, therefore, as a heat engine, the thermo cell appears to follow precisely the law of Carnot, and hence may have a theoretical maximum efficiency equal to that of the reversible engine of this eminent philosopher, yet in practice its efficiency falls very far below this theoretical maximum. It, therefore, follows, that if the result hoped for is to be attained at all, it must obviously be looked for in some other direction than in that of the thermo cell. In considering the matter, another line of investigation suggested itself to me, the results of which I have the honour now to submit to my fellow members of the physical section. It has long been known that the magnetism of the magnetic metals, and especially of iron, cobalt, and nickel, is markedly affected by heat. According to Becquerel, nickel loses its power of being magnetised at 400 deg., iron at a cherry red heat, and cobalt at a white heat. Since, whenever a magnetic field varies in strength, in the vicinity of a conductor, a current is generated in that conductor, it occurred to me that by placing an iron core in a magnetic circuit, and by varying the magnetisability of that core, by varying its temperature, it would be possible to generate a current in a coil of wire surrounding this core. This idea constitutes the essential feature of the new generator, which, therefore, I have called a pyromagnetic generator of electricity. The principle of utilising the variation of magnetisability by heat as the basis of electric machines, though clearly applicable to generators, was first applied to the construction of a simple form of heat engine, which I have called a pyromagnetic motor. A description of this motor will help us to understand the generator subsequently constructed. Suppose a permanent magnet, having a bundle of small tubes made of thin iron placed between its poles, and capable of rotation about an axis perpendicular to the plane of the magnet, after the fashion of an armature, suppose, further, that by suitable means, such as a blast or a draught, hot air can be made to pass through these tubes so as to raise them to redness, suppose that by a flat screen symmetrically placed across the face of this bundle of tubes, and covering one-half of them, access of the heated air to the tubes beneath it is prevented, then it follows that, if this screen be so adjusted that its ends are equidistant from the two legs of the magnet, the bundle of tubes will not rotate about the axes, since the cooler and magnetic portions of the tube bundle—i.e., those beneath the screen—will be equidistant from the poles, and will be equally attracted on the two sides. But, if the screen be turned about the axes of rotation, so that one of its ends is nearer one of the poles; and the other nearer the other, then rotation of the bundle will ensue, since the portion under the screen, which is cooler, and therefore magnetisable, is continually more strongly attracted than the other and heated portion. This device acts, therefore, as a pyromagnetic motor, the heat now passing through the tubes in such a way as to produce a dissymmetry in the lines of force of the iron field, the rotation being due to the effort to make these symmetrical. The guard plate in this case has an action analogous to that of the commutator in an ordinary armature. The first experimental motor constructed on this principle was heated by means of two small Bunsen burners, arranged with an air blast, and it developed about 700 foot-pounds per minute. A second, and larger, motor is now about finished, which will weigh about 1,500 lbs., and is expected to develop about 3 horse-power. In both these machines, electro-magnets are used in place of permanent magnets, the current to energise them being derived from an external source. In the latter machine, the air for the combustion is first forced through the tubes to aid in cooling them, and then goes into the furnace at a high temperature.

The earliest experiments in the direction of the pyromagnetic production of electricity were made with a very simple apparatus, consisting of a charged electro-magnet, having a tube of thin iron passing through its cores near their outer ends, a coil of wire being wound round this tube, and including an ordinary sounder delicately adjusted in its circuit. The tube beneath the coil was covered with asbestos paper. After heating the tube to redness by a gas blast directed into it at one end, a jet of cold air was suddenly substituted for the flame: the sounder at once closed, showing that the change in the magnetisability of the iron had varied the distribution of the lines of force within the coil, and thus had produced a current of electricity in this closed circuit. The construction of a machine of sufficient size to demonstrate the feasibility of producing continuous currents on the large scale in this way was at once begun, and has only just been completed. The new machine consists of eight distinct elements, each the equivalent of the device already mentioned, consisting of the two legs of an electro-magnet somewhat far apart—12 ins. actually—having at one end the ordinary yoke, and at the other a roll of corrugated sheet iron, 0.005 in. thick, called an interstitial armature, this armature having a coil of wire wound upon it, and separated from direct contact by means of asbestos paper. The eight elements are arranged radially about a common centre, and are equidistant, the eight interstitial armatures passing, in fact, through the iron discs which constitute the common pole pieces of all the electro-magnets. The coils wound upon the interstitial armatures are connected directly in series, the whole forming a closed circuit. Through the centre of these discs a vertical hollow shaft passes, carrying at its lower end a semi-circular plate of fire-clay called a guard plate which, when the shaft is turned, revolves close to the lower ends of the sheet iron armatures, and screens off half of them from the access of heat from below. The shaft carries a cylinder of insulating material, having metallic contact pieces let into it on opposite sides, the line joining them being parallel to the straight

edge of the guard plate. Upon this cylinder eight springs press, each of these springs being connected to the wire of the closed circuit above mentioned midway between the coils. The length of the metallic segment is so proportioned that the following spring touches it just as the preceding one leaves it. The springs themselves are so adjusted that each of them comes into contact with its metallic segment just as the preceding coil of the pair to which it is connected is uncovered by the rotation of the guard plate. Upon the same shaft, and above the cylinder just mentioned, a pair of metallic rings are placed, insulated from the shaft, to each of which one of the metallic segments is connected. Brushes pressing upon these rings take off the current produced by the generator. The entire machine now described is placed upon the top of any suitable furnace fed by a blast, so that the products of combustion are forced up through those interstitial armatures which are not covered by the guard plate, and raise them to a high temperature. The field magnets when charged magnetise, of course, only those interstitial armatures which are cold, i.e., those beneath the guard plate. On rotating this plate, the interstitial armatures are successively uncovered on the one side, and covered on the other; so that continually during the motion four of the eight armatures are losing heat and the other four are gaining heat. But those which are losing heat are gaining magnetism, and *vice versa*. Hence, while currents are generated in all the armature coils, since in all the magnetism is varying, the current in the coils beneath the guard plate will be in one direction, while that in the coil exposed to the fire will be in the other. Moreover, whenever an armature passes out from under the guard plate, its condition at once changes; from losing heat and gaining magnetism, it begins to gain heat and lose magnetism. Hence, at this instant, the current in the coil is reversed, and consequently the line connecting this coil with the one opposite to it constitutes the neutral line or line of commutation, precisely as in the ordinary dynamo. Indeed, the action of the interstitial armature coils of the pyromagnetic dynamo resembles strongly that of the ordinary armature coils of the Gramme ring, not only in the manner of connecting them together, but also in their functions; the change of direction in the current as the magnetism of the field changes sign, in the latter case corresponding closely to the change of current in the former case, due to the direction of the temperature change. But it will be observed that while in the Gramme ring the loops between the armature coils are connected to commutator segments equal in number to that of the coils, upon which the commutator two brushes press, in the pyromagnetic dynamo the loops between the armature coils are connected to an equal number of brushes (in this case eight), while the commutator segments are only two in number. So that the functions of the commutator, and the brushes in this generator, are in a certain sense reversed as compared with the ordinary dynamo. The potential difference developed by this dynamo will obviously depend (1) upon the number of turns of wire on the armature coils, (2) upon the temperature difference in working, (3) upon the rate of temperature variation, and (4) upon the proximity of the maximum point of effect. No advantage will be gained, of course, by raising the temperature of the interstitial armature above the point at which its magnetisability is practically zero, nor will it be advantageous, on the other hand, to cool it below the point where its magnetism is practically a maximum. The points of temperature, therefore, between which, for any given magnetic metal, it is most desirable to work, can be easily determined by an inspection of the curve showing the relations between heat and magnetism for this particular metal. Thus the points of temperature at which the magnetisability is practically zero, as above stated, are a white heat for cobalt, a bright red for iron, and 400 deg. for nickel. On the other hand, while at ordinary temperatures, iron has a maximum intensity of magnetisation represented by 1390, its intensity at 220 deg. is 1360, and hence no commercial advantage is gained by cooling the iron below this temperature. Nickel, however, whose maximum of intensity of magnetisation at ordinary temperatures is 800, has an intensity of only 380 at 220 deg. Hence, while this metal requires a lower maximum temperature, it also requires a lower minimum one, but it may be worked with much less heat. The rate of the temperature variation is determined by the rapidity with which the guard plate revolves, and this in its turn is dependent upon the rapidity with which the interstitial armature can be cooled and heated. That it may take up and lose heat readily, the sheet iron of which it is made is very thin—only 0.005 in. thick, even when its durability is increased by enamelling or nickeling—it is corrugated and rolled up so as to expose a large surface—about 60 square feet for the eight armatures—and hot and cold air are alternately forced through the armature. Experiments already made show that the guard plate can probably be made to revolve 120 times a minute. Since the potential difference is proportional to number of lines of force cut per second, it is evident that, by doubling the speed of rotation, twice as many lines of force would flow across the generating coils per second, and the output of energy would be quadrupled. Exactly what thickness of metal is the most suitable for the purpose, what the relative volume occupied by metal and by air space in the interstitial armature should be, what is the best diameter for the armature, or even the best metal, what the best limits of temperature, and what the best speed of rotation to produce the maximum potential difference—all these are questions which must be decided by experiments made upon the generator itself. The results thus far obtained with the machines lead to the conclusion that the economy of production of electric energy from fuel by the pyromagnetic dynamo will be at least equal to, and probably greater than, that of any of the methods in present use. But the actual output of the dynamo will be less than that of an ordinary dynamo of the same weight. To furnish 30 sixteen candle-lights in a dwelling-house, would probably require a pyromagnetic generator weighing two or three tons. Since, however, the new dynamo will not interfere with using the excess of energy of the coal for warming the house itself, and since there is no attendance required to keep it running, there would seem to be already a large field of usefulness for it. Moreover, by using the regenerative principle in connection with it, great improvement may be made in its capacity, and its practical utility may very probably equal the interesting scientific principles which it embodies.



MACHINERY, &C.

A New Invention in Wool Carding.

A new invention has recently been patented by Mr. C. Eastwood, of Bradford, which has an important bearing on machines for the carding of wool. It relates to an improved method of making the feeding rollers. These are so arranged that the pins of each roller intersect those of the roller adjoining. It is well known that, in the rollers in ordinary use, the pins are placed in contiguity to each other, thus pulling simultaneously at the wool. The invention will be readily understood by reference to the Figures 1 and 2—which show the front and end section respectively.

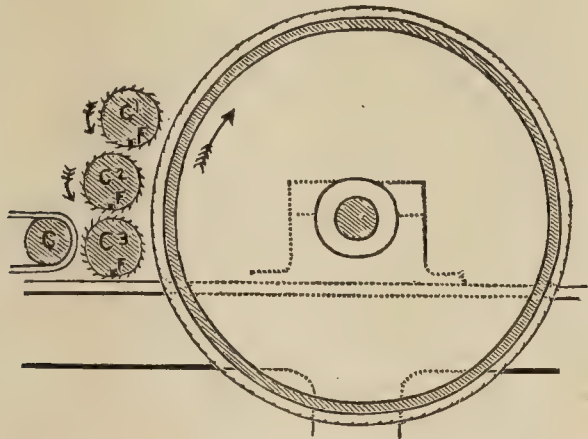


Fig. 1.

Figure 1 shows that the two top rollers, C 1, and C 2, have needles set in the same direction, it not being considered necessary that the top roller should strip the middle one. This secures the best results in the drawing out of the wool. The rollers are made of brass, in segments or rings, being pierced, by the ordinary method, at any angle, and thus any requisite setting may be given to the pins. The maker, Mr. W. Hollingworth, Holme Top Mills, Little Horton, Bradford, claims for the invention, that a better and more regular feed is obtained than under the ordinary method employed, whilst a proper and efficient straightening of the wool is ensured. Further, it is asserted that, by the intersection of the pins, the spaces

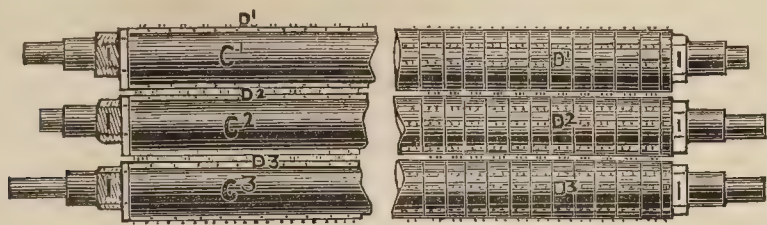


Fig. 2.

between do not become full of dirt, as is usual with leather coverings, and thus, by keeping these clean, a much better grip upon the fibre will result. The rollers are constructed with a view to durability, whilst the grinding necessary to keep the pins in order is reduced to a minimum. Not only is it claimed that work of a superior character results from the use of this invention, but also an increased output is ensured—not less than 60 lbs. of wool per day more being easily turned out; again, it is said that 20 per cent. more “top” is gained when working long wool than by the old method. In briefly alluding to this invention, we may say that we have had opportunities of judging of its capabilities, and we therefore, confidently recommend it to those of our readers using carding machines.

Electric Light.

We were invited a few evenings ago to inspect a small Electric Light Installation, which has been fitted up by Mr. Joseph Edmondson, at 36, Sunbridge Road, Bradford, showing the perfection which can be attained with an Otto Gas Engine. It is well known that the “Cycle” of the engine, giving only one impulse in every two revolutions, presents considerable difficulty in securing steady lights. Mr. Edmondson, however, has succeeded in overcoming these difficulties, and it would be scarcely possible to ensure greater steadiness, even with the best of steam engines. The Gas Engine is a 4 horse-power Otto. It drives two Dynamos. The one for incandescent, and the other for arc, lights. In the window, the incandescent lamps are grouped to show a great variety of mountings, and produce a very pretty effect. The new “Super-Incandescent” Lamps, each of 300 candle-power, are strikingly effective, and are much more economical than the usual 16 or 20 candle-power lamps grouped to give the same amount of light. For looking over piece goods, or for matching colours, Mr. Edmondson shows a “Lighting Set” specially adapted for this purpose, the moderate cost of which should meet the wants of merchants and others who do not care to fit up a larger installation, but to whom a single arc-light would be of great service.

Weldless Boiler Ring Plates.

The necessity for the protection of high-pressure boilers to meet the requirement of triple, and possibly quadruple, expansion engines, has led Mr. J. Windle, of Barrow-in-Furness, to patent an invention for the production of weldless ring plates, by similar means to those adopted in the manufacture of tires. A mill for this purpose has been put down by Mr. Daniel Adamson, Dukinfield, at the works of the Vulcan Steel and Forge Company, Barrow, but at the present time the works are at a standstill, and nothing is being done to develop the patent, and put the mill in motion. Several advantages are claimed for boiler ring plates. They will stand much greater pressure than ordinary plates, which have to be welded longitudinally; higher pressure can be secured even with thinner plates. In the production of ring plates, there is no straining, as in the cases of plates which have to be bent into shape, and whereby great tension of the exterior, and great compression of the interior, of the plates are caused. By rolling the ring plates with a thickened edge, they could at one end be bored on the inside, and at the other end cut on the outside, thus making a perfect joint for the purposes of riveting. Should Mr. Windle's invention prove the success it claims to be, one of the necessities of the times—greater boiler pressures—will be made possible.—*Iron.*

The Trade of the World.

[From Special Telegrams and Sources of News all over the World.]

A NEW EFFORT TO EXTEND BELGIAN TRADE.—It is a strong proof, writes our Antwerp correspondent, of the unsparing energy with which the Belgian Government devotes itself to the promotion of the trade interests of this little, but very enterprising, country, that it is meditating a project for training and exporting young men to different parts of the world where Belgian trade interests can be advanced. The Government have reasoned somewhat after this fashion—Young merchants with means do not care to go abroad. The clever, pushing men who are anxious to try their fortunes beyond the seas are men of no capital. The picked scholars of the High School of Commerce at Antwerp are already educated in a large measure at the expense of the State, and the idea is that further help should be given them to go abroad to complete their professional education. This idea is already in operation to a limited extent, but the help given by the Government so far has been very limited. These travelling scholarships will, in all probability, be greatly increased in value before long. The chief object in view is to attack the supremacy of Great Britain in China and in Japan, countries where hitherto, Belgian houses have not done much good.

TEXTILE INDUSTRY IN URUGUAY.—The Government of Uruguay intends to introduce the textile industry into the country, and with this object has decreed that all textile industrial establishments to be erected in Uruguay are to be entirely free of taxes for a period of ten years, and that all the necessary machines and apparatus are to be free of import duty for the same length of time.

THE ARGENTINE MARKETS.—GERMANY AGAIN.—A correspondent in Buenos Ayres again reminds us that while these valuable markets are being, comparatively speaking, discarded by British manufacturers and merchants, they are being “absolutely ransacked” by the representatives of German houses, who are leaving no stone unturned to get the monopoly of the trade in articles which could be supplied with great advantage from Great Britain, and which, in the majority of cases, would be much more acceptable to buyers if they were brought under their notice, and if the same terms were offered to them as by German agents. Petroleum, metals and machinery, coal, cloth, and textiles generally, form some of the staple imports. Last year the total value of imports into the Argentine Republic showed a considerable increase over those of the previous year, the difference being about \$3,000,000. On the other hand, there was a fall of about \$20,000,000 in the exports. Germany is gaining ground daily in this republic, and now commands nearly an eighth of the total import trade, and takes about one-twelfth of the exports. This is undoubtedly a rising market, and is worthy the attention of British exporters, but they must be represented on the spot by some one speaking the language of the country.

PERSIA.—France supplies 85 per cent. and Germany 15 per cent. of the silks, stuffs, cloth, velvet, paper, and spirits used in Persia. Although we sell the Persians 90 per cent. of their calicoes, we have no share in this trade. This is a state of things to be remedied.

TRADE IN SICILY.—A correspondent in Palermo says:—Velvets are annually imported here to the amount of 824,600*l.*, and are entirely supplied by France and England. France and England also monopolise the market for woollen goods. Coal comes exclusively from England.

PEOPLE WHO WANT TO DO BUSINESS IN VENEZUELA (South America), would do well to lay to heart the following hints, which we give for their benefit. Credit must be given for long terms, if necessary even for two years. Add the interest to the principal. The Venezuelans think this is good business, just as the Irishman did, who, when he wanted money, borrowed from his bankers at 6 per cent., when they were paying him 3 per cent. on his deposits. So long as it pleases them, it does not much matter to us. Before making any sales, the Consul should be applied to as to the solvency of the customer. He will always give information, and information which can, we think, be

absolutely relied upon. The Customs laws of South America should be closely studied, even in details. The Customs officers in Venezuela are not at all bad fellows, but they insist upon a literal construction of the law. They have no imagination—hardly any, when it is a question of tips, for which, indeed, there is no necessity. It is not possible to do in Venezuela as in Spain, where Birmingham travellers in the jewellery line seldom dream of paying duty. In South America, there are but few railroads, and hardly any other roads. The goats have been for the most part the engineers, and, where they have made paths over the mountains, these are the channels of commerce, the merchandise being conveyed by pack mules, horses, &c. The packages should, in every case, be made up most carefully, in accordance with the instructions of the purchaser, and should be well secured. It will always be an advantage if the coverings of the merchandise can be used for some other purpose. For instance, iron hoops, or bands, are readily utilised, but they should not be too heavy, because the duty is based upon weight, and in the classification of goods under the tariffs of South American countries, the coverings pay the same rate of duty as the merchandise which they enclose. The people in South America are supposed to prefer American manufactures, especially of cotton, but we do not believe it, or the North American manufacturers would surely take the trouble to order and brand their goods as the South Americans require them. Textile goods and mercery come chiefly from France, but the Germans have begun to compete for this trade. Cheaper goods are wanted, and too much attention need not be paid to the quality.

THE ELBŒUF CLOTH TRADE.—Our Elbœuf correspondent says that business there has improved not a little during the past few days. Orders are coming in for winter assortments, but the stock is very low, since the Elbœuf manufacturers now only work upon firm orders. They have taken it into their heads, as a fixed article of faith, that their goods are superior to those produced anywhere else, and, therefore, they have formed a syndicate to secure representation in London, which, for some years past, has taken the place of Paris, and is the city of fashion, where all the world's materials go.

In Siam, the wearing of woollen cloaks during the colder weather is becoming general, particularly in Bangkok and the neighbourhood. The female portion of the population are fond of wearing mantles, and they prefer bright colours and varied designs. These goods come partly from Scotland and partly from France, and are sold wholesale at the rate of seven piastres a piece. Why should not Scotland secure all this trade? We do not know. Perhaps some of our woollen manufacturers will tell us.

A MACHINE WANTED IN THE PHILIPPINES.—We draw attention to the fact that a machine is wanted in the Philippines for preparing the abaca flax for the market, and for exportation. This is the plant from which the fibre known as Manilla hemp, used in making Manilla rope, is obtained. A machine was recently tried at Madrid, and was pitted against a native Indian workman. The result was "not satisfactory;" the man produced more flax with less waste than the machine did. The Philippine planters present were greatly disappointed. There is no doubt that whoever invents a machine to meet their wants will make his fortune.

The International Centennial Exhibition, Melbourne, 1888.

The interest in this Exhibition is being well maintained. Applications for space are coming in well, and are of the character that will thoroughly represent the Lancashire products and manufactures. The committee for furthering the interests of the exhibition in the Lancashire Annexe consists of the following gentlemen:—The president, vice-president, and treasurer of the Chamber of Commerce; Messrs. G. W. Agnew, Gloyne (Rylands and Sons, Limited), Waterhouse (Horrockses, Crewdson and Co., Limited), J. Thewlis Johnson (Richard Johnson and Nephew), G. W. Taylor (W. Rumney and Co.), White (D. Moseley and Sons), William Nield (Thomas Hoyle and Sons Limited), Simpson (Simpson and Godlee), Mr. Councillor Milne (Kendal, Milne and Co.), Ledward (Burgess, Ledward and Co.), and H. F. Hibbert. Several other influential names have yet to be added. According to clause 14, in the conditions issued by the Executive Commissioners at Melbourne, and as pointed out by Sir Graham Berry K.C.M.G., during his visit to Manchester, the representatives of countries will be allowed to group their exhibits as they may think fit in that portion of the Exhibition buildings allotted to the country which they represent. The Royal Commissioners for Great Britain and Ireland, and the Executive Committee in London, are strongly in favour of granting space for the Lancashire annexe, and there is not the slightest doubt that this will be an accomplished fact. A meeting has been held of the London Committee of the

Melbourne Centennial Exhibition and the president and treasurer of the Manchester Chamber of Commerce, with the object of arranging for the representation of Manchester at that Exhibition, and how far it would be possible to comply with the request of the Manchester people to have a special annexe set apart for their exhibits. The deputation from the Manchester Chamber of Commerce were informed that, within the portion of the Exhibition allotted to Great Britain, it would be the endeavour of the authorities to keep the Manchester exhibits all together, and to be as generous as possible as regards the allotment of space. The deputation are reported to be reasonably satisfied with the promises given them. A meeting of the Council of the Huddersfield Chamber of Commerce, and of manufacturers interested in the trade of the district, was held at the Council Room for the purpose of conferring with Sir Graham Berry, formerly Prime Minister of Victoria, and now Agent-General for Victoria, with respect to the the Melbourne Centennial Exhibition. The chair was occupied by Mr. J. Lowenthal, and there was a good attendance. Sir Graham fully explained the object of the Exhibition, and the circumstances under which it was to be held, and urged the importance of districts like Huddersfield being represented there. In reply to Mr. J. Priestley, Sir Graham Berry said that the duty on woollen goods sent to the Exhibition would not be enforced unless the goods were sold, then 15 per cent. *ad valorem* would have to be paid. Mr. Henry Blamires asked whether the object of the Exhibition was to get to know all they could about English goods, then to raise the duties on them, and rob English manufacturers of their trade? After further conversation, Sir Graham said the Government of Victoria had offered a premium to the firm who should manufacture the first 500 yards of worsted in that colony. Mr. J. F. Brigg moved, and Mr. R. Skilbeck seconded, a resolution in favour of Huddersfield being represented at the Exhibition, and it was passed. On the motion of Mr. G. Thomson, seconded by Mr. E. Mallinson, the gentlemen present were constituted a committee to consider what form the exhibit of goods from Huddersfield should take.

Important to Producers of Textile Fabrics.

A foreign contemporary (Kuhlow's German Trade Review), in writing on the rapid increase of the foreign competition against which Britain has to contend, says:—For a long time an intense feeling of discomfort has been reigning in English commercial circles at the rapid increase of foreign, and above all, German competition. Unprejudiced individuals are of opinion that the growth of the German element in the trade of London finds its natural cause in the development of the world's commerce, and should in no way be regarded as acting injuriously on the interests of English merchants. Where the individual English clerk is pushed out of an occupation by his German rival, he has only himself to blame. The fact must be ascribed to the defective commercial knowledge of the Englishman, or, if traced to a still remoter origin, to the singularly insufficient character of English education (we refer to both public and private schools),—that education being in most cases an expensive farce, with the laughter all on the side of the schoolmasters. Handicapped as the young Englishman is in London when starting on a commercial life, his position is not much better when he makes his debut as a trader in foreign countries. According to a host of reports, emanating alike from British and other consuls, the development of German, and the decline of English, trade is not so much to be ascribed to the superiority of German goods as to the greater sharpness and activity of the German traders. This circumstance is specially noticeable in Spain, and in the former Spanish colonies of America and Brazil. In woollen goods, the German importers have won the upper hand in the above-mentioned places, England alone retaining her old superiority in the cotton branch. In Chili, more than 60 p. c. of the entire import of woollen goods comes from Germany. In the Brazilian province, Rio Grande do Sul, five times the amount of German as of English woollen goods are imported. Here, indeed, it is to the advantage of the German import trade that the Southern provinces of Brazil possess a very strong element of German colonists. Even in iron goods, Germany is winning ground

from England. The consul in San José (Costa Rica) writes to the effect that Germany competes daily with greater success on the local market, for the simple reason that she produces wares which, if not better, are at any rate just as good as those which come from Birmingham. The British consuls reproach their compatriots with not properly understanding how to suit the wishes and necessities of native populations. An English merchant in South America is far more put about to find an individual, on his official staff, to whom he can entrust the entire management of his business, than is a German. Satisfactory as this state of things most undoubtedly is to the German competitor, the latter must not expect the situation to last very long. The agitation in England for an improved system of commercial education is just at present a violent one, and is likely before long to attain its end. When that complete revolution in the scholastic methods of Great Britain, which is so necessary, and so inevitable, takes place, our German traders abroad will have to look to their laurels. But not till then.

Consular Reports.

SENEGAL.—TEXTILES IN FAVOUR.—The Governor of Senegal has informed the French Minister for the Colonies and the Marine that long cloth and *toile des Vosges* are in much favour with the natives of the French Soudan. Printed calicoes are used principally by the women, and the designs preferred are those with rays of different colours—green, white, red, and blue, alternated by twos, threes, and fours. The heavy tissues have a good sale, but their texture at present is of bad quality. Heavy tissues printed are not in favour with the blacks. Blankets or wrappers do not find a ready sale.

SPAIN.—MADRID.—SPANISH FLOATING EXHIBITION.—Reports from Madrid state that a floating exhibition of Spanish products will shortly leave Valencia. It will call at all the chief ports of South America, including Brazil, Uruguay, the Argentine Republic, Chili, Bolivia, Peru, and Ecuador, with the object of opening new markets for Spanish goods in those regions.

A GLANCE AT THE COTTON INDUSTRY IN RUSSIA.—A foreign Consul says that the cotton factories of Russia are principally concentrated in the provinces of Vladimir and Moscow, where, last year, there existed 36 spinning mills, running 1,453,390 spindles, and giving employment to 83,330 workpeople. In St. Petersburg there are 20 cotton mills, nine of which are occupied exclusively in spinning. The most important of these belongs to the Neva Company. This mill contains 180,000 spindles, and employs about 1,700 hands. Savannah, New Orleans, and three kinds of Egyptian cotton are used. All the mechanical appliances and steam engines were made in Oldham and Bolton. Among the other important cotton factories of the capital may be named that of Charles Pal and three or four other firms with very unpronounceable names. Altogether, 20 cotton factories in St. Petersburg contain 800,000 spindles and 9,500 looms. In most of the spinning mills in St. Petersburg, and in the Baltic provinces, the cotton is mixed before being worked up. The mixture generally consists of American and Egyptian cotton. Indian cotton is not much used. The bases of the mixture used for dressing white tissues are flour, starch, and soap. The bleaching process is generally effected with chloride of lime. The wages of a workman vary from 8 to 11 roubles per week of 72 hours. Women are mostly employed at the looms, and earn, on an average, seven roubles a week. The most important cotton factory in Russia is that belonging to the Kenholm Company. It is situated on the banks of the Harovia. It utilises a powerful fall of water which serves to drive seven turbines, yielding altogether 4,500 horse power. With the exception of the turbines, which were made in Germany, all the machinery was turned out in Oldham. This important establishment contains 280,000 spindles and 1,600 looms. It affords employment to 4,405 workpeople of both sexes. In the Baltic provinces there are only two other cotton manufacturing factories, both of them being at Riga.

Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the four weeks ending Saturday, September 24th, was 345. The number in the corresponding four weeks of last year was 363, showing an decrease of 18, being a net increase in 1887, to date, of 23. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, September 24th, was 1004. The number in the corresponding four weeks of last year was 973, showing an increase of 31, being a net increase, in 1887, to date, of 170. The number published in Ireland for the same four weeks was 31. The number in the corresponding four weeks of last year was 61, showing a decrease of 30, being a net decrease, in 1887, to date, of 192.



ODDS AND ENDS.

A wild plant in Brazil, called the malina, is said to afford a valuable fibre suitable for making sacks and such articles as are now made out of jute.

The machines hitherto used in Germany for the weaving of tulle have been of English production, but, recently, Herr Schädlich, a German machinist, has applied for "Letters Patent" for an invention for this purpose. The loom is said to be, not only much simpler in construction, but more practical than those of English construction.

A number of London merchants and manufacturers intend forming a stock company, with a capital of 10,000,000 yens, for the purpose of erecting cotton and silk spinning establishments, dye-houses and weaving mills, in Japan. They intend to take advantage of the low price of labour in order to produce goods not only to cover the Japanese supply, but for export also.

At a meeting of the Governors of Owens College, Manchester, held a few days ago, the gratifying announcement was made that during the year the college had received bequests and gifts amounting to over £32,000. The late Sir Joseph Whitworth and his executors had given £21,000, and out of this sum it was decided to form a Whitworth Laboratory in the engineering department.

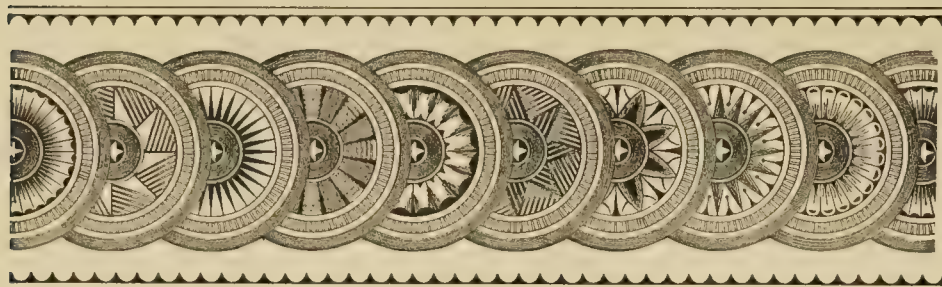
For rendering fabrics, wood, and other inflammable objects fire-proof, a writer in *La Nature* recommends borotungstate of soda, a salt which he states has never hitherto been employed for the purpose. It is made by dissolving boric acid in a hot solution of tungstate of soda. Objects impregnated with this solution are rendered incombustible. The solution gives off no deleterious gas, whilst ammoniacal salts, phosphate of ammonia, and salts of phosphorus render the air irrespirable.

The *Leipziger Monatschrift für Textil Industrie* gives the following receipt for protecting dyers' wooden vats against damp and fire:—Grind oxide of zinc (not sulphite or zinc-white) with glue water till it forms a stiff paint, and paint the wood, which must be quite dry, with it. Allow it to dry two or three hours. Then paint it again with glue water, in which 10 per cent. of its weight of chloride of zinc has been dissolved. This covers the wood with a precipitate of basic oxy-chlorides of zinc, giving it a smooth white surface, and protecting it against both damp and fire.

Mr. Careri, member of the African Society in Naples, has submitted a plan to the Council, concerning the creation of a colonial and commercial institute. The African Society, two years ago, established a colonial and commercial school, and, in order to open a wider field for this work, the society has commenced negotiations with the province, the Chamber of Commerce, and the Bank of Naples, to obtain their co-operation in the creating of a higher commercial school. The special object of this school will be the training of commercial explorers. The following items will be taught:—scientific instructions for explorers, mathematics applicable to commerce, commercial geography, colonisation, industrial and commercial economy, colonial history, statistics, and knowledge of goods and foreign languages.

The Swiss authorities, according to a contemporary's correspondent in Berlin, have recently taken a decision of great importance to importers and manufacturers of goods introduced into that country. They have decided that "foreign manufacturers may affix to goods made for importation into Switzerland the name of the firm or the trade mark of a Swiss manufacturer, provided the latter has especially ordered them to do so." This is a strange decision viewed in the light of the stringent regulations so lately formulated by the French Government, and of the careful legislation on the part of the British Government in the Merchandise Marks Act, to the contrary effect.

To avoid the difficulties and inconvenience attending the use of steam-engines, a strong company has been formed in Paris for the supply of compressed air to users of dynamo machines for electric lighting. A central station has been provided, where engines of 3,000 aggregate horse-power will compress the air for this purpose. The mains are already being laid, and the work is being pushed on with all possible speed to furnish motive-power to the theatres within the time allowed by the government order for the substitution of electric light for gas. With electric lamps and compressed-air engines the maximum of safety from fire will have been attained. The offices of the *Figaro* are to be the first to be lighted by this means. The scheme is to be extended to the provinces, and Lille will probably be the first town to adopt it.



PATENTS.

Applications for Letters Patent.

Automatic apparatus for regulating the backing-off motion in self-acting mules. J. T. Ainsworth, London.	1st Sep. 11,851
Alpha-naphtylamine-mono-sulpho-acid and alpha-naphtylamine and disulpho-acid. J. Dawson and R. Hirsch, Huddersfield.	5th Sep. 11,990
Azoic colouring matters. J. Imray, London.	5th Sep. 12,020
Automatic sight-feed lubricator. R. McDowell, London.	20th Sep. 12,758
Applying steam to yarn during weaving. J. White, Burnley.	12th Sep. 12,847
Automatic feed-water regulators for steam boilers. Messrs. Parsons, Birmingham.	26th Sep. 13,000
Belt pulleys and rope driving wheels. J. P. Tapley, C. Wilson, and W. T. Alexander, Manchester.	31st Aug. 11,788
Bleaching cotton, jute, and similar fibrous substances. J. Smith and P. W. Nicolle, Jersey.	31st Aug. 11,812
Bleaching vegetable fibres. A. C. Henderson, London.	5th Sep. 12,004
Belting. G. E. Stead, Manchester.	9th Sep. 12,209
Combined self-acting or other machine for roughing and boring bobbins or spools, &c. A. Greg, London.	1st Sep. 11,850
Combined flax breaking and double-acting scutching machine. F. Kasperek, London.	2nd Sep. 11,883
Combining fur or fur waste with fabrics made from cotton, wool, &c. J. Nasmith, Manchester.	13th Sep. 12,365
Chenille rugs and carpets. J. Lyle, Glasgow.	14th Sep. 12,463
Carbonising or destroying vegetable matter contained in, or mixed with, woollen, silk, &c. Messrs. Fitton, Bradford.	15th Sep. 12,506
Carding engines in which revolving flats are employed. T. Forknall, Manchester.	17th Sep. 12,612
Combs and bearers for lace machines made without landing bars, known as go-through machines. J. Jardine and J. Chamberlain, Nottingham.	17th Sep. 12,621
Colouring matters and process of manufacture. C. S. Bedford, Liverpool.	19th Sep. 12,667
Construction of metallic cylinders for driving spindles of textile machinery, &c. W. Groom, London.	20th Sep. 12,753
Construction of metallic cylinders for drying woven fabrics, &c. W. Groom, London.	20th Sep. 12,754
Carding machines. W. R. Lake, London.	20th Sep. 12,770
Cap spinning and twisting. G. Clegg, J. Thomas and W. H. Harrison, Halifax.	22nd Sep. 12,854
Cap and ring spinning machinery. A. Ambler, Halifax.	22nd Sep. 12,859
Combing machines. W. H. Shepherd, Bradford.	23rd Sep. 12,902
Cutting rags. W. Browne, London.	24th Sep. 12,934
Driving Belts. H. Müller, London.	3rd Sep. 11,972
Dabbing brushes for Noble's and analogous combing machines. E. Gaunt, W. H. Cockcroft, and S. Best, Bradford.	7th Sep. 12,142
Dyeing yarns. T. F. Naylor, Kidderminster.	8th Sep. 12,144
Dyeing yarns and other fibrous materials, and apparatus therefor. T. Sampson and F. H. Jealous, London.	13th Sep. 12,358
Driving mechanism for carding engines. B. Ormerod and G. Haworth, Manchester.	14th Sep. 12,442
Dyeing wool and other textile materials. T. Skene and L. Devallée, London.	15th Sep. 12,522
Dyeing fibres or fibrous materials. C. T. and H. A. Clegg, and F. Lee, Manchester.	17th Sep. 12,602
Drying wool. W. Nelson and E. Bowen, London.	19th Sep. 12,709
Facilitating the sorting of rags, waste, &c. C. Holt and W. and T. Sefton, London.	9th Sep. 12,234
Finishing woven pile fabrics. Sir Titus Salt, Bart. Sons and Co., and J. W. Pearson, London.	22nd Sep. 12,849
Gears (healds combined) for weaving. J. Gaunt and M. Stansfield, Bramley.	16th Sep. 12,568
Giving intermittent motion to machinery. J. and T. and J. Vicars, Liverpool.	20th Sep. 12,719
Gas engines. E. Korting, London.	22nd Sep. 12,863
Gas motor engines. F. W. Crossley and P. Holt, London.	23rd Sep. 12,920
Invention for the wool trade called the "Wool Buyers' Rule." W. S. Smee, London.	9th Sep. 12,221

Improvements in the furnaces of externally fired steam generators. Messrs. Vicars, Liverpool.	26th Sep. 12,986
Jacquards or dobbies for looms. J. Wild, Halifax.	3rd Sep. 11,952
Jacquards and other looms, and pattern cards therefor. E. Pont and Y. Ricart, London.	3rd Sep. 11,954
Knitting single knot noose healds for looms. Messrs. Kitson, Bradford.	24th Sep. 12,948
Lubricator for loose pulleys. D. Hartley, Bradford.	2nd Sep. 11,891
Looms. D. B. Bailey, Halifax.	3rd Sep. 11,940
Looms. E. Caspar, London.	15th Sep. 12,541
Looms. J. Gaunt and M. Stansfield, Bramley.	16th Sep. 12,567
Looms (smallware). J. Coackley, London.	19th Sep. 12,681
Looms (power). R. B. Thompson, Liverpool.	17th Sep. 12,622
Looms for loop or spot fabrics. J. Matthieson and J. Dewar, Glasgow.	21st Sep. 12,782
Looms for honey-comb and Turkish towels, &c. S. Hirst and J. Middleton, London.	22nd Sep. 12,866
Looms for plush carpets, looped fabrics, and faced fancy goods. W. Fox, Bradford.	21st Sep. 12,797
Lubricant. W. M. Simpson, Liverpool.	24th Sep. 12,967
Measuring and folding cloth. A. Dobson, Belfast.	2nd Sep. 11,902
Milling or fulling woollen or other woven or felted fabrics. W. Fox, London.	3rd Sep. 11,979
Machine belts. H. J. Allison, London.	20th Sep. 12,728
Method of, and apparatus for, steaming yarns. P. H. Ducommun and C. V. Steinlen, London.	20th Sep. 12,776
Novel non-conducting fabric. G. H. Herdman, London.	14th Sep. 12,474
Oil cans. C. Gaul and T. Wolstenholme, Bradford.	2nd Sep. 11,890
Oil can. E. Gorton, Birmingham.	12th Sep. 12,319
Operating the pattern mechanism of looms. M. Leach, Halifax.	16th Sep. 12,569
Operating rising and falling boxes and pattern mechanism of looms. A. Sowden, Halifax.	19th Sep. 12,660
Preparing blocks, plates and rollers for calico printing, &c. W. Duxbury, London.	1st Sep. 11,852
Production of compounds of antimonious fluorides and alkaline chlorides, and the application thereof, and of known combinations of these substances to dyeing and printing. C. D. Abel, London.	1st Sep. 11,879
Production of azo colouring matters. C. D. Abel, London.	1st Sep. 11,880
Pickers for looms. S. Fielden, Manchester.	10th Sep. 12,270
Points and point leads used in levers and go through lace machines, working a great number of bars for carrying and guiding pattern threads. J. Jardine, Nottingham.	13th Sep. 12,360
Printing textile fabrics. J. Birtwistle, Manchester.	15th Sep. 12,502
Printing fabrics. S. Knowles, Manchester.	23rd Sep. 12,901
Preparing machinery. J. Wallace, Jun., Belfast.	26th Sep. 12,988
Rosaniline sulpho acid. J. Dawson and R. Hirsch, Huddersfield.	5th Sep. 11,988
Rotary engine worked by steam, air, or water pressure. A. G. Bateman, Charlton.	14th Sep. 12,448
Rigging woollen, &c., fabrics, or facilitating the winding thereof on boards. W. R. Lake, London.	24th Sep. 12,977
Shrinking and drying cloth. E. James, London.	2nd Sep. 11,935
Self-acting mules. W. Dobson, Manchester.	13th Sep. 12,367
Spooling or winding. A. W. Mathewson, London.	13th Sep. 12,423
Spinning or twisting fibres. E. Tilston and W. H. Nixon, Manchester.	16th Sep. 12,553
Spindles and cops for spinning and twisting. S. Littlewood, London.	17th Sep. 12,628
Scutching, hackling, or similarly treating flax, &c. J. McGrath and E. Manisty, London.	19th Sep. 12,693
Screw gill machinery. J. C. Walker and J. E. Stephenson, London.	23rd Sep. 12,916
Tentering machines. A. Shaw, Halifax.	19th Sep. 12,662
Tension apparatus for beams for lace, &c., machines. A. W. Smith, London.	24th Sep. 12,968
Winding thread upon quills. H. H. Lake, London.	5th Sep. 12,024
Washing, scouring, and bleaching of fibres, fibrous materials and substances. M. Ashworth and R. Wild, Rochdale.	10th Sep. 12,283
Warp-dressing machines. A. B. Rawley and J. Fielding, Manchester.	16th Sep. 12,565
Yarn winding. J. D. Whyte, Manchester.	12th Sep. 12,331

Patents Sealed.

10,793	11,192	3,924	7,413	8,310	8,728	8,952	9,007
9,785	9,902	9,903	10,858	10,933	10,998	11,141	11,164
11,730	15,168	1,833	4,395	5,851	11,097	11,118	12,216
3,195	3,645	7,576	7,818	7,862	10,080	11,237	11,283
11,304	6,807	8,062	10,132	10,932	10,984	11,321	11,872
12,212	3,639	5,662	8,163	10,181	11,516	12,309	12,498
13,127	2,052	6,737	8,452	11,639	11,698	11,751	13,989
1,967	3,967	6,503	8,508				

The Journal of Fabrics

AND

Textile Industries.

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		Improved Carding Engine.	

Notices.

The Yearly Subscription—payable in advance—including home postage, is 10s. Cheques and Post Office-Orders to be made payable to H. & R. T. LORD, 10, Ann Place, Little Horton Lane, Bradford, Yorkshire.

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Literary communications must, in all cases, be accompanied by the names and addresses of the writers, not necessarily for publication, but as evidence of authenticity.

Authors are requested to retain copies of their manuscripts; rejected manuscripts cannot be returned.

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Readers are invited to forward items of interest to the Trades concerned.

The Proprietors will feel greatly obliged if any of their readers, in making enquiries of, or opening accounts with, Advertisers in this paper, will kindly mention the *Journal of Fabrics and Textile Industries* as the source from whence they obtained their information.



The Silk Industries of the United Kingdom.

CONFERENCE AT THE SILK EXHIBITION.

A conference of manufacturers and other gentlemen, interested in the silk industry, was held last month, at the Manchester Royal Jubilee Exhibition, T. Wardle, Esq., Leek, being chairman. In his opening address, the chairman stated that the need for such a conference was fully evidenced by the decreased output of the English and Irish silk centres, and the increased importations of silk goods. Since 1880, up to the last year, our imports of manufactured silks from the continent had averaged 11,000,000 sterling per annum, and that increase had taken place whilst our own silk operatives had suffered the greatest distress from want of work; and Spitalfields had reduced her looms from 24,000 to 1,200, whilst Crefeld, a prosperous German silk town, had doubled its population, and quadrupled its trade. He would not discuss in detail how this condition of things came about, or could be altered, but he would suggest that, in order to bring about a beneficial change, it was necessary that the silk centres should elect for themselves only such representatives as would be capable of defending, maintaining, and expanding, the silk industry. Apart from debateable

fiscal questions, an earnest member of Parliament could do much for technical education for the instruction of artisans, and also for the more important and higher middle class commercial and technical instruction, in which we were so much behind our foreign competitors. Much would have to be done to improve our Schools of Art, and to bring them into harmony with technical instruction and the requirements of our industrial competition. That conference was the outcome of a very serious and determined effort to bring back the silk industry. He believed that with a collective care for our English industries, and with systematic and compulsory industrial instruction, we should be able to make everything required both for home use and for export, and by keeping to ourselves the industries which the foreigner was trying to take from us, we should have but little need of the philanthropic efforts and institutions for the export of the surplus population, and surely that was really what Ireland stood in need of at the present time. There was no doubt that England possessed prestige and example for a splendid future in the production of silks, and he did not hesitate to say that England enjoyed a more suitable climate for silk manipulation than France, Germany and other continental countries, where the atmosphere was less laden with moisture. He suggested the periodical compilation of local and general statistics. They were far behind France and Germany in that respect, and, in fact, possessed no reliable statistics. After speaking of the raw silk resources of India, Mr. Wardle concluded by calling attention to the capabilities of Siam as a silk producing country, and by reading a letter from Lord Kimberley, in which he observed that he could not see why India should not become their source of supply for silk, just as she was becoming for tea.

THE REVIVAL OF THE SILK TRADE.

Mr T. Dickins read a paper on "The revival of the Silk Trade of Great Britain and Ireland." He said that, notwithstanding its depressed condition, he was of opinion that they need not despair of the future prosperity of the silk trade. They had not exhausted their powers of recuperation. They had not sufficiently applied the lever which alone could raise them to prosperity. That lever was technical knowledge, which Huxley defined as "the marriage of science with industry," and which was essential to all industries. Our foreign rivals had no monopoly of skill, taste, or talent. They had some advantage in lower paid labour and longer hours, which constituted a considerable item in the cost of production, but compensation was to be found in mechanical perfection, ingenuity and adaptability of design and arrangement. Moreover, longer hours did not always bring greater results. He recommended that every silk centre should have a technical school, where instruction in the various qualities and treatment of silk should be given, and papers thereon read and discussed. There should also be a systematic course of teaching, drawing, and designing to selected pupils—special attention to be given to the throwing processes, particularly the proportions of twist or spin as most suitable to the intended fabrics. As a more immediate and exemplary means for the desired revival, he advised the formation of a company with ample capital—say £100,000 or more—for the manufacture of silk and silk-mixed goods, to be established, not in any spirit of home rivalry but rather, as a means and medium for gathering and diffusing such knowledge as would best promote the interests of the trade generally. The products of such a combination of powers would certainly be of such excellence as to command success. The ladies of England would, he was sure, delight to co-operate in this national enterprise. Good taste was the pleasure and object of all cultivated minds, and true genius in any form was always appreciated. In these attainments our continental neighbours were at present transcendent—the *raison d'être* being that they had reached a higher education—a position of degree which we should reach if we proceeded onwards in good earnest. Alderman Wright (Macclesfield), suggested that if they did not go back to protection, they ought to have something like a protective trade mark, and all foreign goods coming into this country should be so marked as to be easily distinguished by the purchaser. In the discussion which followed, the opinion was freely expressed that much of the depression of the silk industry was due to the operation of Free-Trade in England and protection abroad.

THE REMEDY FOR SILK DEPRESSION.

Mr. Mackower, London, contributed a paper entitled "The Present Depression of the Silk Industry and its Remedy." After referring to the causes of the depression, Mr. Mackower suggested as the remedies for the depressed industry that power looms should be more generally used, and that the manufacturers should use the whole of their energy for the production of a really good article which would stand the test of wear. He also suggested the formation of a committee to watch the industry and to promote its interests, and to impress upon the rising generation the absolute necessity of learning foreign languages in order to be better able to represent native industries abroad, and by visiting the centres of foreign silk manufacture to bring back with them their newest ideas and improvements to adopt in England if satisfactory.

FAIR TRADE.

Mr. S. Cunliffe Lister contended in his paper that trade had been seriously crippled, almost annihilated, by the free importation of foreign goods, and that Free Trade was the cause of all our loss and trouble. It was equally clear, and beyond dispute, that under a system of protection it flourished, and that we were then able to supply the home market almost altogether, as at that time we only imported about half a million sterling of silk goods, whereas we now imported on the average about eleven millions. If it could be shown that the destruction of the silk trade was for the general good, then he for one would submit without a murmur; but when it was simply sacrificed at the shrine of one of the most absurd fiscal policies the world had ever seen or known, he thought it was quite time they should endeavour to bring about a change. Free Trade would have been discredited and come to an end long since if platform orators on both sides of politics had not in times past (not so much so now) insisted that it was the chief cause of our great prosperity, whereas it was a very remarkable fact, but perfectly true, that it had nothing whatever to do with it. That as a practical man of business, having had as large experience as any living man, he said unhesitatingly on that platform, in that city—the cradle of Free Trade—that no Free Trade country can compete. He challenged the Free Traders on this point. It was quite true that free imports must, and would, force down wages, although Mr. Bright said the contrary, and that was what Free Traders aimed at, though they dared not tell the working man so. That would indeed be a gain—a great gain in the race of competition. As he had not troubled them with any figures, let him do so with a few facts. Take Germany, America, Canada, and Victoria; all these nations had adopted Protection quite recently. America, since her frightful civil war, was now the wonder of the world; Germany, under Bismarck Protection, was equally prospering; Canada was flourishing as she never did before, and was for that reason more and more inclined to Protection; and Victoria—Protectionist Victoria—was far more prosperous than Free-trade New South Wales. Could they ask—would they wish—for further proof that Protection was the true policy of all nations? Suppose our continental rivals were to meet together to consider how they could best destroy England's supremacy as a manufacturing country; they would first put a duty upon all that we sent them, and thus cripple and destroy our foreign market; next they would insist upon their goods being admitted free, and so spoil our home market, and then impose a Factory Act to limit our hours to 56, whilst they worked 72, so as to increase greatly our cost of production. Now, this was just what we had done for ourselves. Was there any wonder the country suffered. It would indeed be truly surprising if it did not.

ADULTERATION.

Mr. Harvey Heywood read a paper on "The Adulteration of Silk," in which he suggested that Government should insist upon all silk goods brought into this country being stamped with the amount of weighting matter, so that the pure could be distinguished from the spurious.

The Russian postal authorities have announced that money remitted through the Russian post-office in an ordinary, or even a registered, letter is liable to be confiscated. In all such cases the remittance must be noted and the value declared.

Technical Education and Foreign Competition.

We have received a pamphlet on the above subject, from Mr. Swire Smith, of Keighley, a well known member of the Royal Commission on Technical Education, it has been reprinted by the National Association for the promotion of Technical Education, from the *Westminster Review*. Much of the information contained in the pamphlet has already been put before the manufacturing community, not only by Mr. Smith, but also by other gentlemen who have the welfare of the industrial population of this country at heart. We propose to place before our readers some short extracts from the work, and at the same time would strongly advise them to purchase and peruse it for themselves, as by so doing they will have a fund of information at their command on a subject of vital importance at the present time to this country. The pamphlet is divided into two parts, the first sketching the growth of the manufacturing industries in this and other countries since the era of the great mechanical inventions, and the second dealing especially with the question of what should be done to keep up the supremacy of this country as a manufacturing nation. Mr. Smith says "the problem before us is at once the simplest, and yet the most important, industrial problem of the age. First surpass the foreigner in our own markets, we shall then surpass him in all the neutral markets of the world. We contend that our industrial regeneration lies in the more appropriate scholastic training of our people for the work of life. Happily, this will not entail any diminution in their material comforts; but, on the contrary, a vast increase in their refinement and civilization, inasmuch as "the training which makes men happiest in themselves, also makes them most serviceable to others." The systems of education on the Continent vary in details, but in the leading countries the schools rise in well-defined steps from the lowest to the highest, each grade preparing the student for the next above. The elementary schools supply the groundwork of education to rich and poor alike, and in several important States they are free. The elements of science are taught in Germany and Switzerland, and many pupils in elementary schools throughout France and other countries receive workshop instruction. After the age of fourteen, when compulsion ceases, the German schoolboy, on commencing to work, unless he passes an exceptionally high standard, must attend a night school in the winter months, till he is at least sixteen; and in France and Belgium, special facilities are afforded him in free night-schools for studying the various forms of art in their application to industry. In modifying our educational system in accordance with the industrial wants of the country, the changes necessary do not entail any serious revolution. The great industries of the country are more or less localized in certain districts, and, therefore, the character of the special instruction need not be extensively varied. The textile manufactures of cotton, wool, flax and silk, and the engineering, machine-making, dyeing, printing, and the subsidiary trades connected with, and dependent upon, them, are grouped together in separate localities. The same may be said of the iron and steel, cutlery and hardware trades, shipbuilding, mining, and the chemical and pottery industries. In every school, without exception, drawing and appropriate elementary science should be taught. A course of instruction in the use of a few manual tools would be most useful to every schoolboy, with distinctive practical teaching where necessary, and theoretical instruction bearing upon the nature and properties of the various products connected with local industries. In every school in the country districts some of the elementary principles and facts of agriculture, and instruction in the use of tools, should be imparted. Having regard to the position and prospects of the scholars, the manual instruction might be so arranged as not to be detrimental to their general intellectual progress; for example, in some instances it might be given out of school hours, and in the factory districts half-timers might be exempted from it on the ground that, during a portion of each day, they would be already receiving the best of all practical instruction, that of the factory or workshop. The imparting of instruction is not so much a question of time as of skill and method. From close observation in a manufacturing town, where the majority of scholars from ten to thirteen in the Board schools are half-timers, we are able to state that, although they receive less than fourteen hours of

instruction per week, and attend the factory for twenty-eight hours per week in addition, yet they pass as high a percentage at the examinations as the average passes of scholars throughout the country, receiving double the amount of schooling." Mr. Smith points out that "those towns which are at the present time preparing for the building and organisation of technical schools and colleges, and are anxious to receive all possible help from public sources, may obtain from the Science and Art Department a building grant for approved accommodation for the teaching of art of 2s. 6d. per square foot, to the maximum extent of £500, and an equal grant for £500 for science. For approved furniture and fittings for science and art, and for a reference library of scientific books for the use of students, a grant may be obtained of 50 per cent. upon the cost, besides important grants in aid of teaching." He also gives a summary of what has been done by The Clothworkers' Company in aid of the various Technical Institutes that have already been formed. He then refers to the Imperial Institute as follows:—"What a magnificent field is open to the Imperial Institute in promoting organization for affording a special training to intending settlers and colonials for turning to the best possible account the inexhaustible resources of our empire! A number of Chambers of Commerce of Germany a few years ago sent out a special agent to Australia to ascertain the wants of our colonists, and to open up commercial relationships between them and the manufacturers of Germany, and the Commissioners interviewed an agent from a district in Germany connected with the manufacture of cutlery and hardware, who had just returned from a commercial tour to some of our colonies and South America, where he had established commercial connections on behalf of his countrymen. Surely these illustrations indicate important work for the Imperial Institute demanding immediate attention. The Institute will also supply long-needed information to colonial traders, relating to such machinery, tools, and manufactures as the several colonies may require. The museum of raw materials and industrial products will strikingly illustrate the resources of India and the colonies, and at the same time show to British manufacturers the kind of implements, machinery, and varied manufactures which each colony may desire to procure in exchange for its products. A desirable feature of the scheme of the Institute would be the establishment of departments in all the technical schools or other provincial museums of the United Kingdom, containing duplicate collections of the products which India and the colonies desire to sell, and of the British manufactures which they wish to buy, the selection in each instance being suited to the productive powers and requirements of the district to which it was sent. The establishment of local museums in the colonies, with specimens of British products suitable for importation, with information as to the means of obtaining them, would form a commercial connection of a most practical character, encircling the whole of the British Empire. In these respects the Imperial Institute may well become the centre and heart of the scheme of technical education, in active sympathy with, and responding to, the commercial and industrial needs of every portion of the empire."

Book Notice.

Woollen and Worsted Cloth Manufacture, by R. Beaumont, M.S.A., Lecturer at the Yorkshire College. G. Bell & Sons, London.

This work treats upon the physical structure and clothing properties of the raw materials, or fibres, used in the production of the above fabrics; the various processes of yarn construction; the preparation of the yarns for weaving; the manipulation of looms; designing and colouring of texture, and the operations to which the cloth is submitted subsequent to weaving. Separate chapters have been devoted to the manufacture of woollen and worsted threads respectively, and also to the various classes of fancy yarns. The special uses of yarns in the formation of patterns are also ably treated of. The loom has received much attention, both for hand and power work, numerous illustrations tending to make the descriptions, &c., plainer to the student than would be possible otherwise. Designing, as regards pattern, colouring, and the use of fancy yarns, is thoroughly put before the reader, and in such a manner that the work cannot fail to be of the greatest utility to either workman or employer. Under the heading of "Cloth Analysis," the system of dissecting woven fabrics, whether composed of wool, worsted, cotton, or silk yarns, has been described, including explanatory notes on the method of calculating the weight of warp and weft used in the production of goods of a prescribed length and width. Calculations of the most important

kind occurring in cloth manipulation have been dealt with in such a manner that anyone possessed of the rudiments of arithmetical knowledge ought to be able to work easily by perusing them. A chapter is also given on milling, raising, and finishing, various kinds of cloths. The work gives in as concise a form, and yet in as comprehensive a manner, as possible the whole of the processes from the raw material to the manufactured fabrics. We predict for this work a standard place amongst the too few books of practical value now before those interested in the various branches of the textile trades. The volume, taking into consideration the quantity of valuable information, is published at the low price of 7/6. It will be forwarded (carriage paid) to any address on receipt of Postal Order for 7/9.

The Trade of the World.

[From Special Telegrams and Sources of News all over the World.]

THE IMPORTATION OF MACHINERY INTO AUSTRO-HUNGARY.—We learn from a foreign official report that during the second quarter of the present year, 724 machines, weighing 16,582 met. ctr. were imported duty free into Austro-Hungary. Of these, Great Britain supplied 36.7 per cent. in weight, Germany, 30.4 per cent, Switzerland, 30.4 per cent, and France and America together 2.5 per cent. The machinery imported from Great Britain was required for cotton, linen, and jute manufactures. Germany supplied machinery for cotton and woollen industries, also for the manufacture of sugar paper and tiles, while Switzerland furnished machinery for cotton, silk and embroidery manufactures. From France there only came some refrigerators and a little machinery for linen manufactures, and the imports from America consisted entirely of reaping machines.

THE IMPORT TRADE OF GREECE.—Our correspondent in Athens says that the foreign trade of Greece has fallen off during the last two years to the extent of 15 to 30 per cent., owing to the commercial crisis which has weighed on the country, and the great fluctuations in the rate of exchange. Amongst the exporters to Greece, no country has gained so much ground during the last few years as Germany, most of the principal commission houses in Athens and the Piræus being of German origin. The greatest obstacle to trade in this country is the long credit which is required and is indispensable, since the rate of interest is 8 per cent. with the banks, and 10 to 12 per cent. with private sources. The importation of machinery has fallen off, manufactures seeming to make but little progress in Greece. The trade in cotton goods is almost entirely in the hands of the English. Some attempts were made to introduce Alsatian manufactures, but they proved too heavy and dear for the market. Hosiery and knitted goods generally are imported from Germany, and ready-made clothes from Austria. Formerly, England did a considerable trade in Greece with articles of caoutchouc for technical purposes, but has latterly been supplanted by Germany. As regards materials for men's clothing, the Germans do a good business in buckskins, but plain smooth cloth is imported from France, and fancy patterns from Belgium. England only supplies cheap woollen goods. Materials for ladies' dresses are principally obtained from France, where the stocks remaining after the close of a season can be bought for half price.

HINTS FROM BRAZIL.—The machinery import trade could be largely augmented. At present its value is less than £400,000. Silk goods come chiefly from France. Weight 120,650 lbs.—official value about £140,000. Three-fifths of the linen fabrics come from Great Britain. About half the woollen goods are British, and nearly all the rest come from Germany, France and Belgium. Manufacturers who wish to develop this market would do well to consider the following report, written by a German expert:—"The imports must be carefully adapted here to the tastes of the consumers. In cotton goods, for instance, the Brazilians like pretty and taking patterns rather than durability. The Brazilian cotton mills imitate chiefly the qualities and patterns of the United States. British woollens, as regards baizes and blankets, are seriously interfered with by a local faction."

HOW GERMANY IS CATCHING US UP IN RIO.—We hear from Rio that British manufacturers and merchants must look to their laurels unless they are contented to see themselves supplanted by the ubiquitous German, who is steadily gaining ground in the Rio market, not exactly by the superiority of his goods, but by untiring energy, cheapness, and a somewhat unscrupulous use of brands and names which, in former times, earned their reputation by intrinsic qualities which the German wares do not possess. In textiles, the Germans are still behind the British and French, but are steadily gaining ground, having exported

nearly 10,000 bales to Rio in 1886. In iron and steel goods, especially machinery, the German trade is rapidly developing itself. Paper is an important article in this market, and of 48,589 bales imported in 1886, 28,522 came from Germany.

HOW THE RUSSIANS ARE TRYING TO EXPLOIT PERSIA.—Our correspondent in Moscow says that Russian merchants have of late been giving great attention to the Asiatic markets as outlets for their goods, and are devising means to overcome the British competition in those countries. Exhibitions of the articles most required in those markets are being planned, and the important firm of Sensinow Brothers are exhibiting in Moscow such goods as are suitable for North-Eastern Siberia and the neighbouring islands. The firm of N. N. Kenschin, which for some years has had a factory in Teheran, intends opening an exhibition of Russian manufactures in that capital, and hopes in that manner to drive out other European goods from the Persian markets. This exhibition is to be opened at the beginning of next year, and will consist of five groups. 1, Woollen, cotton, silk, and flax textiles; 2, metal goods; 3, sugar, tobacco, soap, oil, india-rubber, chemicals, glass, porcelain, and earthenware; 4, furniture, carpets, specimens of bookbinding, &c.; and 5, carriages and fire engines, &c. It has now been decided to open the exhibition of textile manufactures in Warsaw on the 15th of January, 1888. Many German manufacturers of textile machinery have already applied for space.

THE IMPORT TRADE OF TRIPOLI.—Our correspondent, referring to the import trade of Tripoli, says that calicoes form the most important item received from Great Britain, large quantities being consumed in Tripoli itself and throughout the whole Regency. There is also a good demand for gold, silver, and silk, brocades, and bright coloured satin, some of which is supplied by France.

PRODUCTION OF SILK IN THE CAUCASUS.—According to the *Monteur Official du Commerce*, the efforts made by the Russian Government to encourage the production of silk in the Caucasus have proved a failure. The last three seasons have been the worst known for the past 16 years, and the disease of the mulberry tree, known by the Tartars as Kumeul, and supposed to be caused by too much moisture, has done an immense amount of damage. By this excessive watering, the trees lose their leaves, and the roots are covered by a species of fungi allied to the mildew and the black rot.

Consular Reports.

MODIFICATIONS OF CUSTOMS TARIFFS.—CEYLON.—The only alteration in the tariff of Ceylon is in respect of the official rating of cotton goods for (*ad valorem*) duty. The "assessed value" of grey shirtings, madapolams, cambrics and jaconets, is reduced from 65 to 55 cts. per lb.; of grey domestics, long cloths, sheetings and tea cloths from 55 to 45 cts. per lb.; of grey mule twist, Nos. 30 to 60, from 55 to 45 cts. per lb.; of Turkey red yarn, grey weight, from 1.40 Rs. to 90 cts.; and of other colours from 75 to 55 cts.

GERMAN COMPETITION IN BRAZIL, AND HOW TO COPE WITH IT.—Mr. Consul C. W. Bennett, of Rio Grande do Sul, returns to the subject of German competition with British traders in Brazil, and points out that the British imports passing through the Rio Grande do Sul Customs-house in 1886 amounted to £143,897 and German to £142,824; the values for the last six months of 1885 being £77,048 and £66,712 respectively. Nor is this result, he says, to be greatly wondered at, seeing that there are only three British importing houses in the town, and, with the exception of a very few good native and foreign houses of business, all the remainder are controlled by Germans. Germans live and thrive upon smaller profits, and, however little the business, there is always someone in the house who is being trained to carry it on when the principal retires—a good custom which is rarely observed in British houses abroad. To this fact may be traced the decay of many old houses, and the short-lived commercial efforts of the separate units into which they usually split up. Moreover, in the province under notice, a very large proportion of the purchasing class are Germans by nationality or descent, and, when their tastes can be suited with German goods, it is only natural that the traders should purchase from their own country, rather than from the foreigner. The bulk of the British imports may therefore be considered as goods which

cannot yet be produced in Germany; and exported thence so cheaply as from England. There is no doubt that the feeling widely prevails that what is of British manufacture is good, but the selling power primarily lies in cheapness, and a fraudulent trade mark, a familiarly coloured box, or a well-known label, will generally induce the purchaser to believe that he is buying for less money the serviceable article which answered his purpose so well before. The purchaser gains knowledge by experience, the seller by customers' complaints and reduced sales. The question of supplying inferior goods to compete with German deserves careful attention, but the risk of making a present profit at the expense of a loss of reputation for good workmanship—which may easily affect more persons than the actual manufacturers—should not be lost sight of, especially as a revival of trade generally would probably first be felt by those who had consistently, in evil days, produced the best work. Unless it be in chemicals and drugs, and in earthenware, it is absurd to suppose that Great Britain enjoys the monopoly in any single article imported into the province of Rio Grande do Sul. For improving British trade, commercial travellers should be utilised, for the wholesale distribution of printed matter is useless. "Were there a local institution for the protection and furtherance of British trade, all communications regarding private—as distinguished from general—trade questions, might with advantage to all parties be referred to it. A private firm, with a staff of good local travellers, who would undertake to keep a sample room, and act as local agents for a number of different trades, would answer a useful purpose, and might be made remunerative. Such a firm would not be difficult to find, and Mr. Archer, Vice-Consul of Porto Alegre, says in his report that his house would be pleased to undertake a somewhat similar business. Undoubtedly the facilities which are now within the reach of everybody for importing direct from any European port, instead of, as formerly, through London and Liverpool, have done much to decrease business of the old commission importing houses, and have caused trade to settle down upon a broader and firmer basis of direct supply and demand. Viewed in this light, the above suggestion may look like an attempt to bolster up a decaying trade, and interfere with natural laws; but the method is honest, which is more than can be said of all the influences adversely affecting British trade in Rio Grande."

Mr. Vice-Consul Archer, of Porto Alegre, Brazil, does not think commercial travellers of use in pushing trade in his district. The truth is, that it is not so much British manufacturers that have been driven out of the field, as that British merchants have had the foreign trade with their own country wrested from them. This, he explains, as does Mr. Bennett, by the failure to provide successors in established businesses when the heads of those businesses retire. "Amongst other suggestions that have been made for the furtherance of British trade, is one that show-rooms should be established in connection with all the principal Consulates. It is obvious that, to have a complete range of samples of every manufacturers' goods in every branch of trade would require enormous premises, and would be impracticable, but the idea to some extent is good, and might, perhaps, be carried out in part to some advantage. I am somewhat diffident in mentioning it in this place, but as a *Trading Consular Officer*, I shall be glad to take charge of, and exhibit by means of my own firm, any samples suitable to this market which manufacturers may wish to send."

JAVA.—A foreign Consul writing about Java, in 1886, says:—In cotton goods, imitation tricots for drawers are in great request and are supplied chiefly by the Saxon manufacturers. Buckskins and worsted goods are also largely imported from Germany, but in woollen coverlets, the English article maintains its well-earned reputation. In black and coloured satins, Germany competes with Lyons and Switzerland.

THE TRADE OF SMYRNA.—A foreign Consul says that the crisis which for sometime has affected the Smyrna market seems to be gaining in intensity, as the unsatisfactory state of trade has been aggravated by the partial failure of the crops, owing to the long-continued drought. Rain, however, has fallen latterly, otherwise the ruin of the agricultural population would have been inevitable, and in many districts a famine was apprehended. As the importers dispose of a large quantity of their goods in the interior, their prosperity depends greatly on the crops, and it is feared that money will be so scarce this year that many will

not be able to meet their engagements. Scarcely any progress has been made lately in manufactures, and the carpet works, forges, breweries, and flour mills existing in the Smyrna district are none of recent date. The Government has, however, wisely abolished all monopolies as far as manufactures are concerned, and anybody offering the requisite guarantee can obtain authority to erect a manufactory. The value of the importations in 1886 is estimated at 75,753,749f., and that of the exports at 124,590,696f., against 89,347,540f. and 115,910,917f. respectively in 1885. The diminution in the value of the imports is to be attributed to the fall in the prices of nearly all articles of importation. Cotton manufactures form one of the principle items of import, and are almost exclusively supplied by Great Britain, notwithstanding the efforts made by the Germans to obtain a footing in the market. Spun cotton is also chiefly imported from Great Britain, though the Austrians, Germans, and Italians compete in red thread.

NO ENGLISH HOUSES IN SAN JOSE.—In the capital of Costa Rica, San José, according to Mr. Consul Sharpe, with a population of 30,000, there is a larger business done, perhaps, than in most places of equal size, and, amongst the chief merchants and foreign storekeepers, there are five Germans, three French, three Americans, three Spanish, two Columbian and one Danish, but not one English house.

ENGLISH MACHINERY IN POLAND.—Mr. Consul Grant, of Warsaw, says that of the machinery used in the Polish textile mills, England supplies about three-fourths to the cotton and one-third to the woollen mills, the rest being partly imported from Chemnitz and Mulhausen, and partly made in the country. English machinery is always preferred for worsted and combed yarns, and all higher class goods. The machinery for the silk industries comes mostly from Switzerland.

GERMANS v. ENGLISH IN NORWAY.—Mr. Consular-Agent Monsen, of Tonsberg, is of opinion that English goods are considered superior to those of other countries, but German manufactured goods are much cheaper, and the country is overflowing with German commercial travellers, who bring samples, and in an eloquent manner persuade the merchants of this country to buy their cheap goods. They are more active than the English, and the representatives of German wholesale houses consequently get the largest amount of business. Mr. Consular-Agent C. S. Larsen, of Brevig and Langesund, says the cotton goods used are solely British, while woollen goods are imported chiefly from Germany, as also are ironware goods, principally on account of the lower prices. Mr. Vice-Consul Eyde, of Flekkfjord, reports that English Bessemer steel competes successfully with Belgian, German, and Swedish iron. It is considered preferable to Swedish iron, and is sold at a cheaper rate, and would certainly quickly supersede all other kinds if pushed in the markets by energetic agents. Germans compete most sharply with British manufacturers, but they adopt the scandalous method of using "inscriptions in the English language."

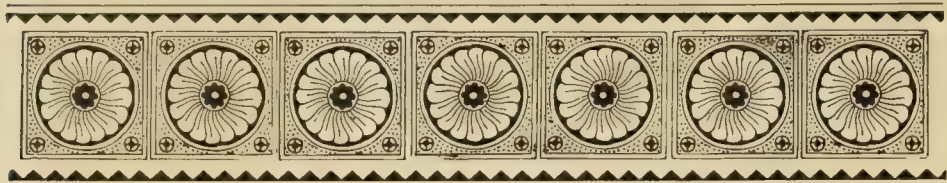
IMITATION OF CHINESE TEXTILES.—Mr. Consul Warren, of Taiwan, says in 1886 the experiment of the importation of imitations of Chinese goods manufactured in Manchester was once more tried, but again proved to be a failure, showing a loss of about 20c. per piece. The goods were of better quality than those imitated; but the cost of manufacture prevented their competing successfully with the native article. Woollens have decreased. The import is at all times small, and is not likely to increase, except in the case of blankets, which are all of German manufacture. As a contrast to the foregoing, Mr. Consul Scott, of Wutru, remarks that "if it is possible in England to manufacture *fac-similes* of Chinese native cloths, the experiment will, no doubt, soon be made. I use the word "*fac-simile*" for the purpose of pointing out that I am doubtful whether mere imitations can meet with much success."

A Game of Brag.

No one can doubt that the Americans are past masters in the science of Brag. Lately, a circular has come into our hands published by one of the leading machinery firms in America, in which attention is called to the improved quality of the yarn produced in American mills. This table may be of interest to our readers, so we give it in extenso.

Number.	Breaking Strain. lbs.	Number.	Breaking Strain. lbs.	Number.	Breaking Strain. lbs.
3	530.0	36	48.7	69	28.2
4	410.0	37	47.6	70	27.8
5	330.0	38	46.5	71	27.4
6	275.0	39	45.5	72	27.1
7	237.6	40	44.6	73	26.8
8	209.0	41	43.8	74	26.5
9	186.5	42	43.0	75	26.2
10	168.7	43	42.2	76	25.8
11	154.1	44	41.4	77	25.5
12	142.0	45	40.7	78	25.3
13	131.5	46	40.0	79	24.9
14	122.8	47	39.3	80	24.6
15	115.1	48	38.6	81	24.3
16	108.4	49	37.9	82	24.0
17	102.5	50	37.3	83	23.7
18	97.3	51	36.6	84	23.4
19	92.6	52	36.1	85	23.2
20	88.3	53	35.5	86	22.8
21	83.8	54	34.9	87	22.6
22	79.7	55	34.4	88	22.4
23	75.9	56	33.8	89	22.2
24	72.4	57	33.4	90	22.0
25	69.2	58	32.8	91	21.7
26	66.3	59	32.3	92	21.5
27	63.6	60	31.7	93	21.3
28	61.3	61	31.3	94	21.2
29	59.2	62	30.8	95	21.0
30	57.3	63	30.4	96	20.7
31	55.6	64	30.0	97	20.5
32	54.0	65	29.6	98	20.4
33	52.6	66	29.2	99	20.2
34	51.2	67	28.8	100	20.0
35	50.0	68	28.5		

We are informed that "this table gives the average breaking weight from reports sent to us by over 225 representative mills," and that "the entire range of the table is above the English Standard of super extra quality as published by Hyde." It is probable that, shortly, a paragraph will be sent round the American papers to the effect that the American spinners can produce, and are producing, better yarn than the English, of course the machinists would have it understood that this superiority is the result of the use of their particular productions. We are quite prepared to learn that American yarns have lately improved considerably in quality. It could hardly be otherwise considering the enormous quantity of English made cardroom machinery lately introduced into America. The list, however, is very misleading, in more particulars than one. First, we do not accept Hyde's standard of super extra quality as being correct. In England, counts lower than 20 are not often spun of super quality, or, if so spun, are spun very soft, twisted for special purposes, but where strength is an element, super quality 20's, really spun 21's, can be purchased with a breaking strain of from 100lbs. to 120lbs. Common 32's twist, spun 33's and 34's at Oldham, can be found which breaks at over 52lbs., and, strange to say, the super qualities of 32's twist are often found to break at a less weight than the inferior qualities. In every case, from 20's upwards, the English extra super quality (where strength is the quality aimed at), breaks at more weight than the American. The average of the finer counts must have been obtained from the mills spinning yarn for thread making, mills chiefly built by Englishmen and filled with English machinery. One other point we should like to mention. The Americans, as a rule, spin their yarns with considerably more twist per inch than we do in England; consequently, strength is no criterion as to the quality of the yarn produced. In many cases, it is little better than a bastard crape yarn. Such yarns may suit their market, but English spinners have their own reasons for not spinning their yarns in this manner. In most cases, the mills making the return weave their own yarns, and would not for that reason be particular as to the correct counts being spun. It would, therefore, be more proper to take the true breaking strain of 20's as that given for 21's, which, being only 83.8 lbs., would be considered in England as that of a very medium yarn. There can be no doubt that the Americans are rapidly improving in their cotton spinning as well as in their manufacturing. They had, however, plenty of room for this improvement, and, were they not so conceited, would improve more rapidly.



ORIGINAL DESIGNS.

On our first plate we give a design for a Toilet Cover.

* * * *

Our second plate contains a pattern for a Linen Table Napkin.

* * * *

On our third plate are several neat and effective designs for Cotton Dress Goods.



MONTHLY TRADE REPORTS.

Wool.—The markets during the month have only been quiet, buying has been for actual requirements, and prices, except for some special sorts, have ruled a shade weaker. Fine and half bred wools have mostly favoured buyers with regard to price, and in botany wools especially there has been some irregularity. In the Scotch districts, trade has been depressed, and at the recent Glasgow sales, the attendance of purchasers was under the average, and the greater part of the wool offered was withdrawn, although, afterwards, private sales were effected, but mostly at lower rates than those current a month or two ago. The yarn trade has been rather quiet as spinners have not been disposed to make any decided concession in the price generally demanded by buyers, and, in consequence, business has been considerably retarded. In botany yarns, very little business has been done, and stocks have, therefore, begun to accumulate. In the piece branch, fancy goods manufacturers have been fairly busy, and many novelties have secured to them good orders, but the plain trade has ruled flat, and makers of this class of goods are crying out for new business.

Cotton.—The raw material has shown signs of activity during the whole of the month, and especially was this the case towards the close, when much speculation took place with a hardening of prices. Steadiness has been the characteristic of the yarn branch, with firm prices, induced by the cheerful state of the markets for raw material, still, spinners have produced more during the month than has gone into consumption, and buyers of yarns have therefore generally offered lower prices, but without success, as spinners have kept to firm rates during the whole of the month. In the cloth branch there has been some irregularity as regards demand. The home trade has, on the whole, been more cheerful, with a rather improved trade and generally firm rates, whilst, for export, business has been much quieter, with moderately firm prices.

Woollen.—In nearly all departments of this industry, new patterns are either in the hands of merchants, or are being prepared for ensuing seasons, and good orders are fully expected from the many excellent cloths that are now being offered. Business has not yet improved as was expected a month ago, still a sanguine feeling pervades nearly all branches of this manufacture. In the better class of worsteds, perhaps as much business is being done as ever was the case, and moderately good orders have already been taken. In other kinds, also, within the next few days operations on a large scale are expected. In tweeds, cheviots and such like fabrics, for trouserings, suitings, overcoatings and mantlings, some good things are already being shown by manufacturers with satisfactory results. Generally, prices keep very firm, and in many cases, especially in the better classes of cloths, extreme rates are asked.

Linen.—There has been an improvement in most departments of the trade, but the orders given out have only been small, still they put manufacturers in a better position than for some

time past. The fancy damask branch has been the least satisfactory, as production has exceeded the consumption, and new orders have only been few. In plain kinds, a fair business has passed. In domestic cloths, also, a moderate demand has ruled, and the same may be said of sheetings, drabbets, drills, diapers and similar other fabrics. Flax has generally been quieter, with depressed prices, and stocks have accumulated. The jute industry has improved both as regards demand and prices, and the outlook for the future is more cheerful than for some months past. Orders in fair quantities have been on offer, and prices asked by spinners and manufacturers have been a shade higher, and these have generally been given.

Lace.—A general quietness has pervaded this industry, and especially has this been the case in the plainer descriptions of goods. Inquiries have been few and of a nominal kind, and where orders might have been taken, such low prices have been offered that manufacturers have felt compelled to refuse new business. To such a low ebb have prices come that a reduction in wages in many branches is talked of, and, in consequence, strikes are apprehended, and an uneasy feeling is the result. The curtain trade has only been quiet, and the production has been in excess of consumption. Bobbin nets have been in less request. Fancy laces, if in novelties, have had a moderate demand, but at unremunerative prices generally.

Commercial Museums.

According to the *Bulletin du Musée Commercial*, the Japanese Government has established, in connection with the school of commerce in Tokio, a Commercial Museum for the purpose of exhibiting foreign articles of trade, which are likely to be of interest to Japanese importers, this important school contains 500 students, who are being trained in the latest principles of commercial science, in the hope of their disseminating these principles throughout the country. The *Bulletin* suggests the importance of European merchants, desirous of trading with this country, contributing samples to this museum, and adds that specimens may be sent addressed to Mr. Takashi Masuda, Hitotsubashidori, Tokio, Japan. From the same source we learn that a Commercial Museum is to be established at Trebizond under the auspices of the Belgian Consulate in that city. The *Moniteur Officiel du Commerce* states that the French Minister of Commerce and Industry has approved the founding of a Commercial Museum by the Avignon Chamber of Commerce.

A New Bleaching Process.

A Berlin firm has discovered, and patented in Germany, a new process for bleaching vegetable and animal fibres, which is likely to prove of great utility. Hitherto the use of oxygenated water for bleaching purposes has been very limited, as this product soon loses its efficacy if carried to any great distance. The inventors found that oxygenated water can, in most instances, be replaced with advantage by baths obtained by adding peroxide of barium to the solution of certain salts. The peroxide of barium is decomposed very slowly in the water, and throws off oxygen. These decolouring properties imparted to the saline solutions are, to a considerable extent, independent of the nature of the salts, and the most favourable results are obtained with alkaline silicates, the chloride of ammonium and the alkaline borates. The chloride of magnesium and phosphate of soda act less powerfully, and still less the sulphates. The proportional weight of the salts and the water in which they are dissolved varies considerably, but a mixture of one part of peroxide of barium, one part of silicate of soda and 400 parts of water, is sufficient in most instances. A more concentrated solution may be employed for bleaching vegetable fibres, such as linen, jute, rags, paper, pulp, etc., but in the case of animal fibre, a stronger proportion of silicate might act prejudicially, owing to the alkali which is disengaged. For jute or linen, the process requires one or two days. The peroxide of barium may be mixed with the silicate solution, or a mixture of pulverized peroxide of barium and silicate may be dissolved in water.



TOILET COVER



LINEN TABLE NAPKIN.

12TH NOVEMBER, 1887.



No. 485. Design.



No. 486. Pegging Plan.



No. 486. Draft.



No. 487. Design.



No. 488. Design.



No. 488. Design.



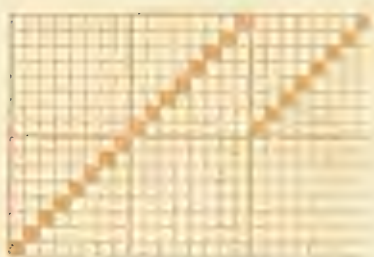
No. 488. Pegging Plan.



No. 489. Pegging Plan.



No. 489. Design.



No. 488. Draft.



No. 490. Design.



No. 489. Draft.



No. 490. Pegging Plan.



No. 490. Draft.



No. 491. Design.



No. 492. Design.



No. 491. Pegging Plan.



No. 491. Draft.



No. 493. Design.



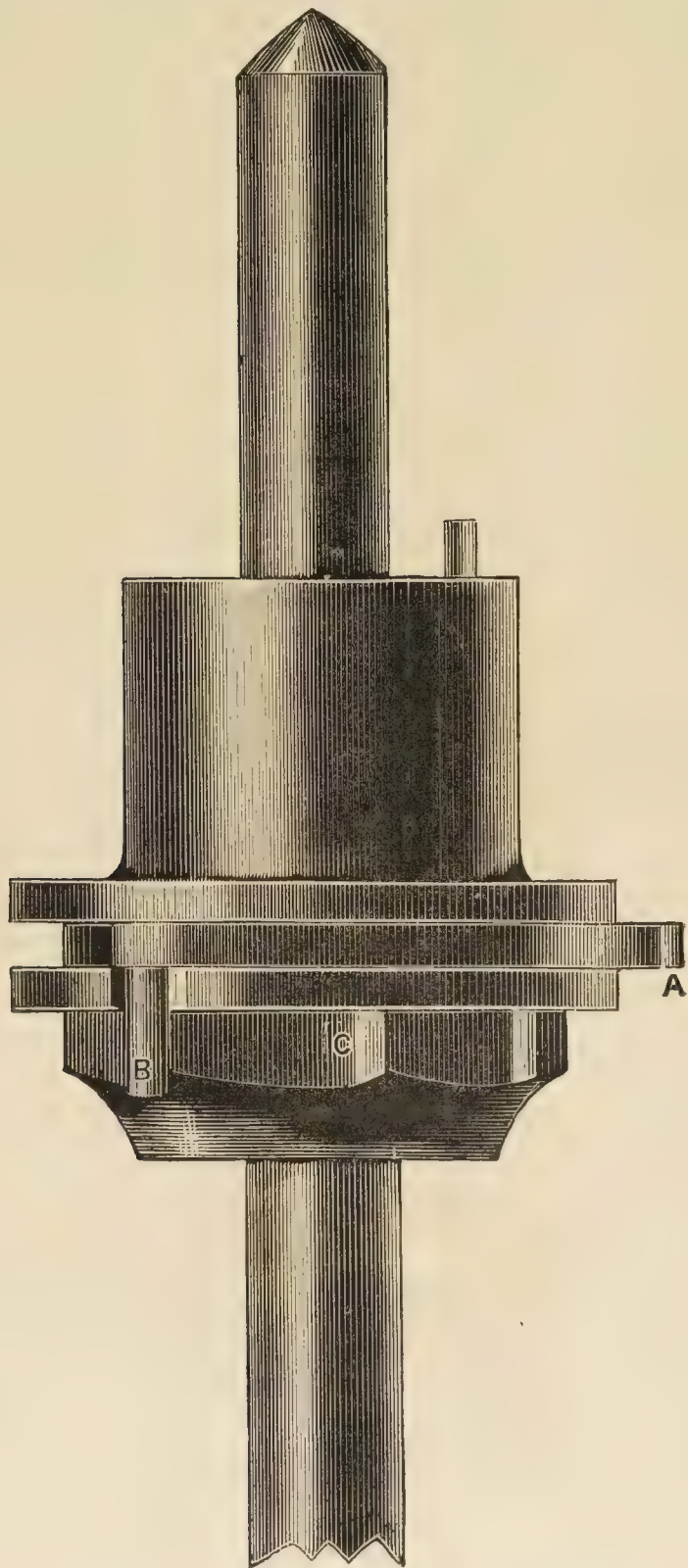
No. 493. Design.



MACHINERY, &C.

A New Stop Motion for Cap Trap Twisters.

In our July issue, we gave an interesting notice of a new stop motion for doubling, winding, and twisting frames, introduced by Mr. George H. Holden, Carr Street, Blackfriars Street, Manchester, sole licensee of Messrs. T. Unsworth and Co.'s numerous patents. This would, doubtless, be read with interest, being of practical advantage to spinners. Anything, in these days of keen competition, which will enhance the value of any product, should be looked upon with particular favour, and it is, therefore,

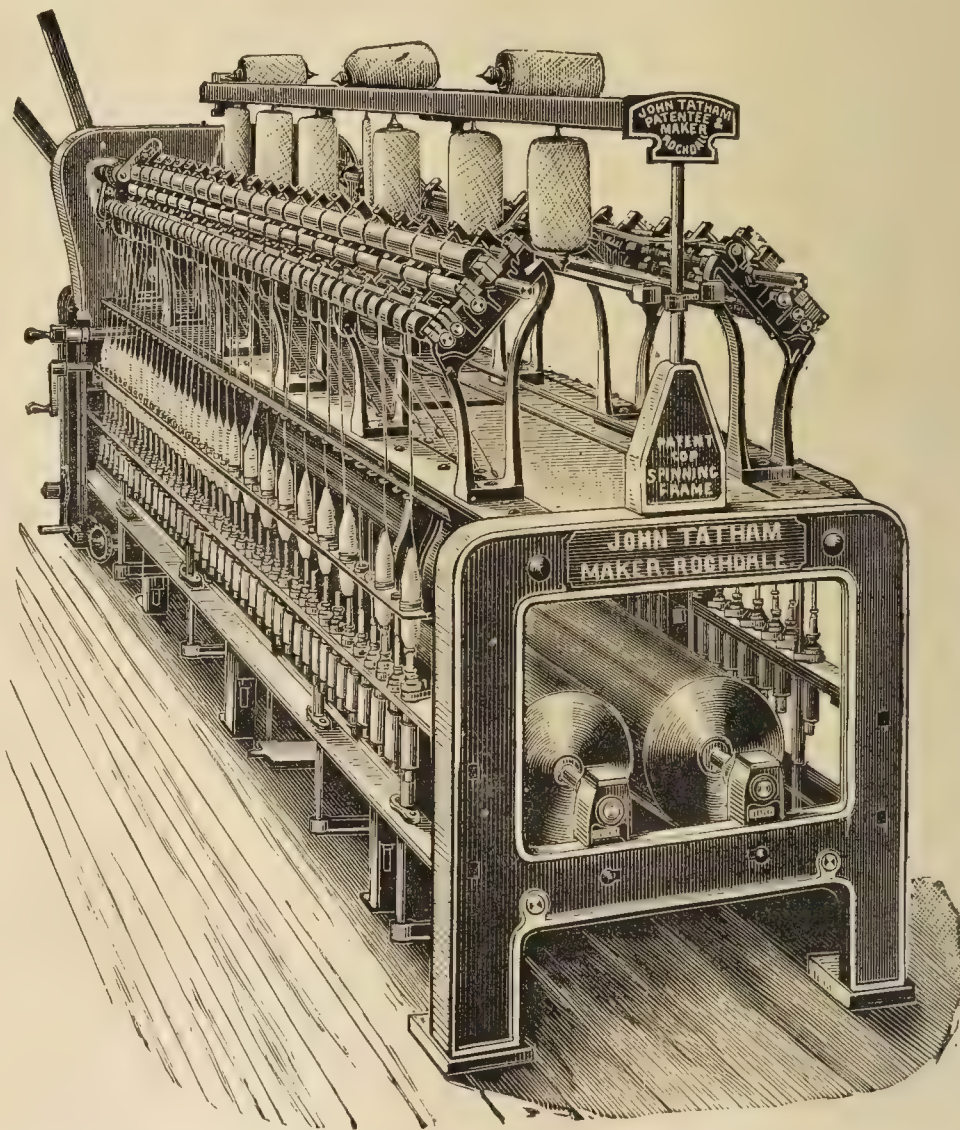


with pleasure that we draw the attention of our readers to a new stop motion equalling in efficiency the appliance mentioned above, and which emanates from the same firm. The success achieved in this present invention is due to Mr. G. H. Holden, who has given much attention to a new motion which should effectually supersede the present cap trap twisters. We believe we are right in stating that up to the present time a serious fault in existing machines has been what is known as "hard twist;" this has existed because the friction plate driving the twist roller does not start positively when a thread is pieced up. There is a slippage, and, consequently, a hard twist. Now, by the invention under notice, which we illustrate, these frictional parts are immediately put into positive gear the moment the thread is pieced up, so that it is impossible to make hard or uneven twist. To accomplish this has been a source of great trouble for a number of years, almost every possible means having been adopted with this end in view. The present motion is the most effective and positive we have yet seen or heard of. How the inventor accomplishes his object will be readily understood from the following:—

when a thread breaks, the present stop pin drops and presses in the lever A, which brings out the pin B clear of the ratchet wheel C, consequently the stop motion acts perfectly. The moment the thread is pieced, the stop pin is raised from point A of the lever, and the pin B drops into the first tooth of the ratchet C., which action immediately attaches the top friction plate to the bottom one, not allowing the roller to go more than an eighth of a revolution of the twist roller. A point in favour of this stop motion is that existing machines may be fitted with it at a moderate cost, and we may add that several firms have already taken advantage of this, being convinced of the value of the invention, and have had it applied to their machines with success, evidence of which has been demonstrated to us.

Patent Bare Spindle Mule Cop Worsted Spinning Frame.

The New Patent Bare Spindle Mule Cop Worsted Spinning Frame, of which we give an illustration below, has been designed with a view to effect improvements in this class of machine which cannot fail to draw the serious attention of spinners, manufacturers, and exporters of yarn. It is not necessary to enter fully into details with regard to the general construction of the machine, it will be sufficient to notice particularly the benefits derivable from the improvements. The drawing roller arrangements employed are similar to those ordinarily seen in the frames in general use throughout the worsted districts, but whereas these frames usually spin upon wooden bobbins, the one under notice is arranged to spin cops upon the bare spindle, or upon short paper tubes, similar to those at present



produced by the French system of spinning by means of the mule. To what degree this is advantageous to the spinner and manufacturer will be readily understood. In the first place—wooden bobbins are entirely dispensed with, and thus a serious item of expenditure caused by their breakage is obviated. Further, a saving is effected in carriage from the spinner to the manufacturer—a point which should greatly interest the exporter of yarns, as the cops can be easily transmitted any distance, in ordinary packing cases, without liability to injury. This patent also affects the weaver in one or two important particulars. By dispensing with the cumbersome wooden bobbins, and using cops spun upon the bare spindle, or upon paper tubes, it will be easily recognized that double the quantity of yarn may be contained in the shuttle, and thus one-half the time given to changing the bobbins is saved, and, moreover, only one half the number of joinings in the yarn are necessary. Thus the weaver gets through more work, and at the same time it is more efficiently done, whilst a saving in power, owing to the absence of heavy bobbins, results. These remarks on the application of these cops to the loom are chiefly directed in reference to weft yarns, yet they have equal bearing upon warp yarns. The maker, Mr. John Tatham, Moss Lane, and Milnrow Road Iron Works, Rochdale, has attained a high standard for excellence in all machinery for the manipulation of worsted, woollen, and cotton fabrics, from whom further particulars, regarding the machine under notice, may be obtained.

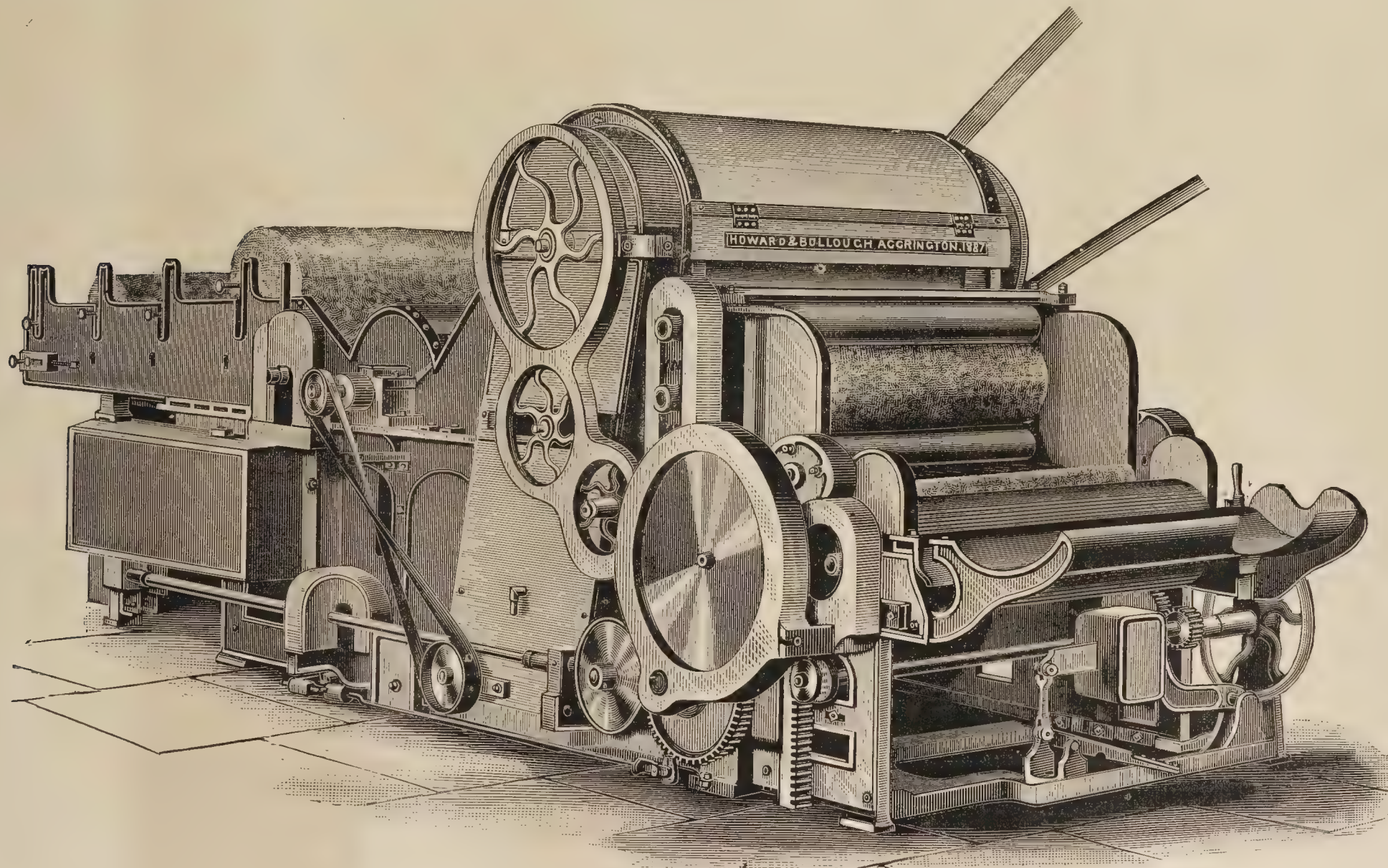
Messrs. Howard and Bullough's Single Beater Scutcher.

Messrs. Howard and Bullough, Accrington, the well-known makers of every variety of machinery for the manipulation of the cotton fibre, have had an admirable exhibit of the products of their works at the Manchester Jubilee Exhibition. This consisted of a single beater scutcher, three revolving flat cards, a drawing, a slubbing, an intermediate, a roving, a twist ring, a weft ring, and a wet doubling frame, a carding engine bend, and a sizing machine. It is scarcely necessary to say that such a display, made by a firm well known throughout the entire cotton world, has deservedly attracted a great amount of attention, and it may, therefore, interest our readers to learn that Messrs. Howard and Bullough have capacity for turning out 72 machines of various kinds, and of first-class workmanship, weekly, by the aid of 1,800 men, whom they constantly employ. Having said so much by way of introduction, it is our intention to devote a few lines to a description of some of the chief points of the machine first mentioned, the Single Beater Scutcher, which claimed our attention in the Exhibition, and of which we give an illustration. In a future issue, we hope to give prominence to some other of their mechanisms. In this machine, the makers have introduced many improvements, foremost amongst which may be mentioned an arrangement of five "air grates," on the principle of the venetian blind, to take the place of the dead plate. These can be regulated according to requirements, and thus an increased or diminished draught through the bars may be secured, and by means of

The cross bar in which the bowls and pins work are made to open on hinges, so that bowls and pins can be taken out and cleaned without falling loose on the floor. The quadrants for the strap fork in the regulator box are balanced, thereby causing the strap to work evenly and thus ensuring perfectly even work. The cone drums are flanged so as to prevent oil getting on the strap. This flanging is a great improvement as it causes the straps to wear very much longer. The beater makes 1,200 revolutions per minute, and the machine makes laps for 40-inch rollers and clearer cards, or 37-inch for revolving flat cards.

A New Smoke Consumer.

An invention of importance to steam users has been patented by Messrs. Ashworth and Kneen, of Dalton-in-Furness, which, while bringing about an economy of something like 35 or 40 per cent. in the consumption of coal, also secures the total abolition of smoke. This new furnace, which has been experimented upon with the most rigid and searching tests, has been patented in Great Britain and 15 other countries. The most careful tests by Mr. D. K. Clarke, C.E., testing engineer to the National Smoke Abatement Institution, have demonstrated beyond the possibility of doubt that the new regenerative furnace will make a given amount of steam with a much smaller quantity of coal than is required to be used at present. It can readily be fitted to any boiler, marine included. Consequently it will be seen that the discovery is of the greatest import-



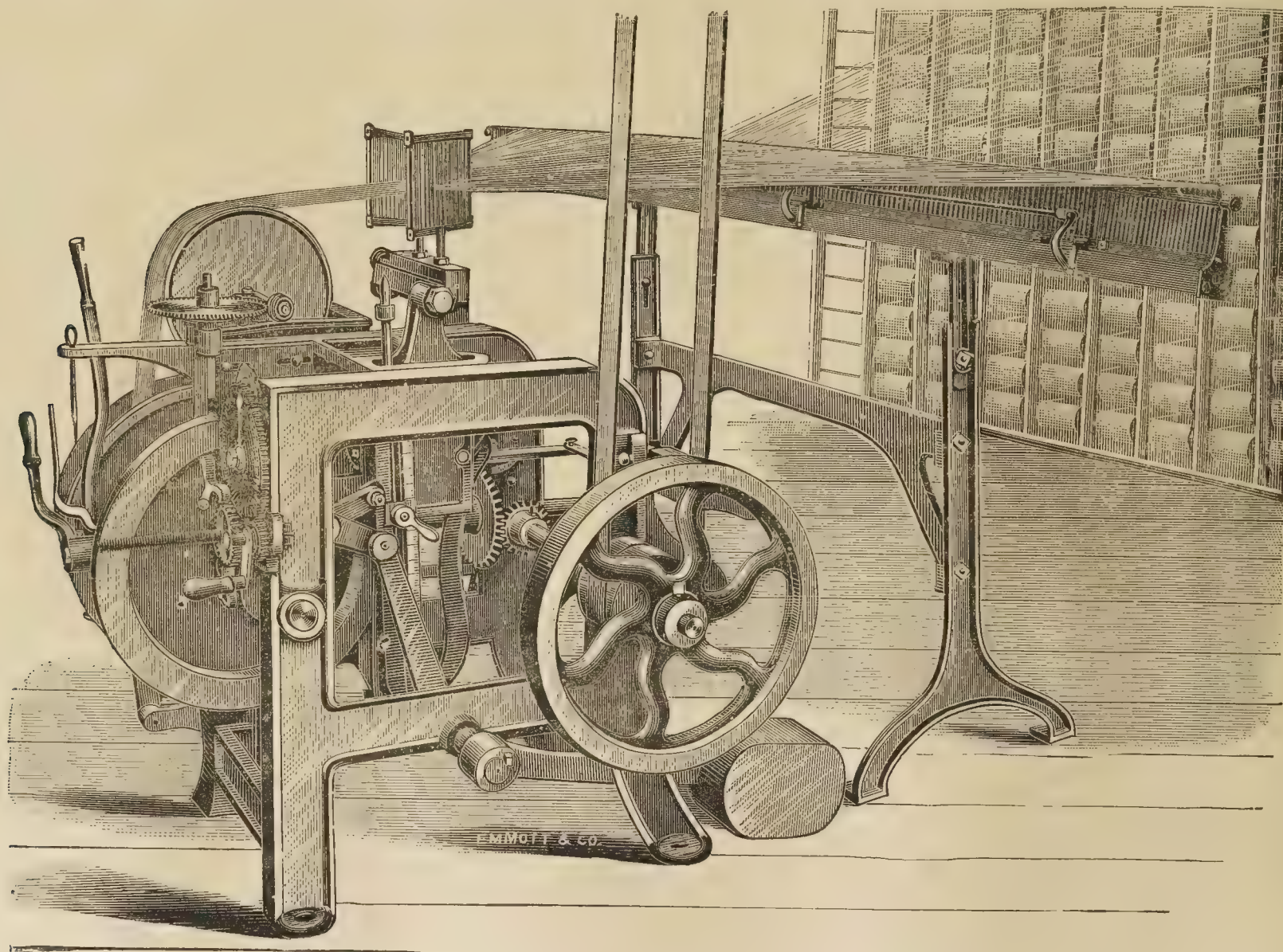
Messrs. Howard and Bullough's Single Beater Scutcher.

which all impurities contained in the fibre have the best chance of falling into the dirt chambers below. As a means of effectually preventing these impurities from returning to the machine, a division plate has been introduced, by which the air passages are separated from the dirt chambers. To meet the wishes of the purchaser, the cleaning bars from beater to cages, can be placed either in a longitudinal or transverse direction. As the cages are made from perforated steel sheets, there is no liability of breakages in the joinings, and no stoppage of draught by the seams. The lattice apron is driven by a side shaft, and the regulator by a side shaft and gearing, therefore, all possibility of slipping is prevented. Attention has been given to an arrangement to prevent the fault known as "licking," four compression rollers having been fitted to the machine, which answer this purpose admirably. For driving purposes, instead of the counter shaft being secured to the ceiling of the room, it is placed above the machine, and is supported by pedestals fixed to its frame. This is a new arrangement which will doubtless find favour amongst many users of these machines. Another important improvement in this machine is the patent pendants, each of which has three anti-friction bowls with loose pins, whereby the friction is reduced to a minimum. One side of the pendant is plain, and works against the two outside or large bowls. The other side of the pendant has a rib or projection which works on the centre or smaller bowl. These three bowls work on a pin independently of each other, and are case-hardened.

ance to steam users. Further than this, the application of the new furnace to any boiler means the complete abatement of all smoke, a matter in which most of our large towns are deeply interested, as the smoke emitted from factory and other chimneys is felt and recognised to be not only a nuisance but a danger to health. Many scientific men, including some of the naval dockyard authorities, have inspected the new furnace, and speak of it in high terms. Hitherto, in the best designed boiler, even with careful manipulation of the fires, the waste usually amounts to one-half of the total combustion of the coal. The Ashworth and Kneen furnace is specially designed to effect the rapid and complete intermixture of the combustible gases which pass from the ordinary furnaces with a supply of heated air, for the purpose of effecting their complete combustion, with the entire prevention of smoke. Mr. D. K. Clarke says a high temperature is kept up behind the bridge by means of zigzag checker work, and oxygen from the atmosphere is conveyed, without passing through the glowing carbon on the bars, and being robbed of its vitality and rendered useless for the purpose of combustion, in a thoroughly mixed and uniform condition to the gas when thus intensely hot, the result being perfect combustion, even in the case of ordinary or smoke coal. Mr. Clarke states that he witnessed a boiler, having the Ashworth and Kneen patent fitted to it fed, with ordinary slack, producing absolutely no smoke whatever, and that for a whole day, the evaporation during the same time attaining to 10'975lbs., or practically 11lbs. of water per

pound of coal; while in the case of ordinary boilers, according to Mr. Sennett, a high authority in engineering circles, an evaporated duty from the best Welsh coal, which has considerably more heating power than ordinary North country slack, usually amounts to something much less than nine or ten pounds of water per pound of coal, nine or ten being the maximum for the best Welsh coal. Mr. Clarke further states that, by means of the Ashworth and Kneen system, as much as 11'96lbs., or practically 12lbs. of water, was evaporated per lb. of Newcastle coal. Messrs. Ashworth and Kneen can evidently give to our navy the boon of smokeless funnels, an important matter, especially in time of war, without resorting to the use of Welsh coal, and, at the same time, a greater power for developing their engines. The air, which is heated to about 250deg. Fahrenheit, is delivered into the hot-air chamber at the back of the bridge. Six days of systematic trials were made by Mr. Clarke, three with the patent system, and three without it, elaborate care being taken to obtain correct results. It was remarkable that, while less coal was consumed by the patent system, a much greater quantity of water was evaporated, a clear indication of increased heat, with a lessened consumption of coal. It was shown by these experiments that the ordinary furnace consumed as much as 23 per cent. more coal per hour than the patent furnace, which also evaporated 25 per cent. more water per hour; consequently 51 per cent. more water was evaporated per pound of coal by the patent system than by the ordinary furnace. The augmented evaporative efficiency corresponded to an economy of 34 per cent. of coal. This is a most important result for the consideration of steam users. When the air blast was shut off, the flue behind the partition was darkened with black smoke, which was speedily displaced by bright flames when the blast was restored. The products of combustion were found to be flameless and transparent, and the chimney top was perfectly clean.

in winding off the sections to form the warp, waste would occur at the end; or, should the defect get past this point, it would prove more serious in the loom, because all the strain induced by shedding would have to be borne by the highest tensioned portion. This would result in numerous breakages of warp threads, and a considerable depreciation of the quality of the cloth. Besides obviating these difficulties, it has been sought to obtain several advantages in details by an improved arrangement of the parts. These will appear in the subsequent description, and the general aspect of the machine will be gathered from the accompanying illustration, on the section shaft is a cam which actuates a ratchet that gears into a wheel upon a screw, and which is traversed by the revolution of the latter. Upon the end of this screw is a fork carrying a pair of links which operate two vertical levers, one having its fulcrum at the bottom and the other at the top. By these means a perfectly parallel movement of the screw is secured. Between the levers just mentioned is a double swing lever in two parts; between, and into, this is inserted a screw, the function of which is to regulate the tension, which is adjusted by the small handle at the top. In starting work, the two parts of the double swing lever are brought to a vertical position parallel with each other. Arranged above the two horns or projections of these levers, and upon a vertical pillar, is a compensating weight, which, as the section warp increases in diameter and the horns separate from one another, falls down between them, pressing against them, and preserving the highly-desired uniformity of tension. The driving shaft upon its extremity carries a bevel wheel gearing into another upon a cross shaft, the latter carrying a friction bowl which presses against one of the section flanges, and by causing it to revolve winds on the yarn. In order to provide for the making of sections containing selvage threads, the section shaft is furnished with a second friction plate, so that by bring-



Mr. J. H. Stott's Improved Patent Warping Machine.

Improved Patent Warping Machine.

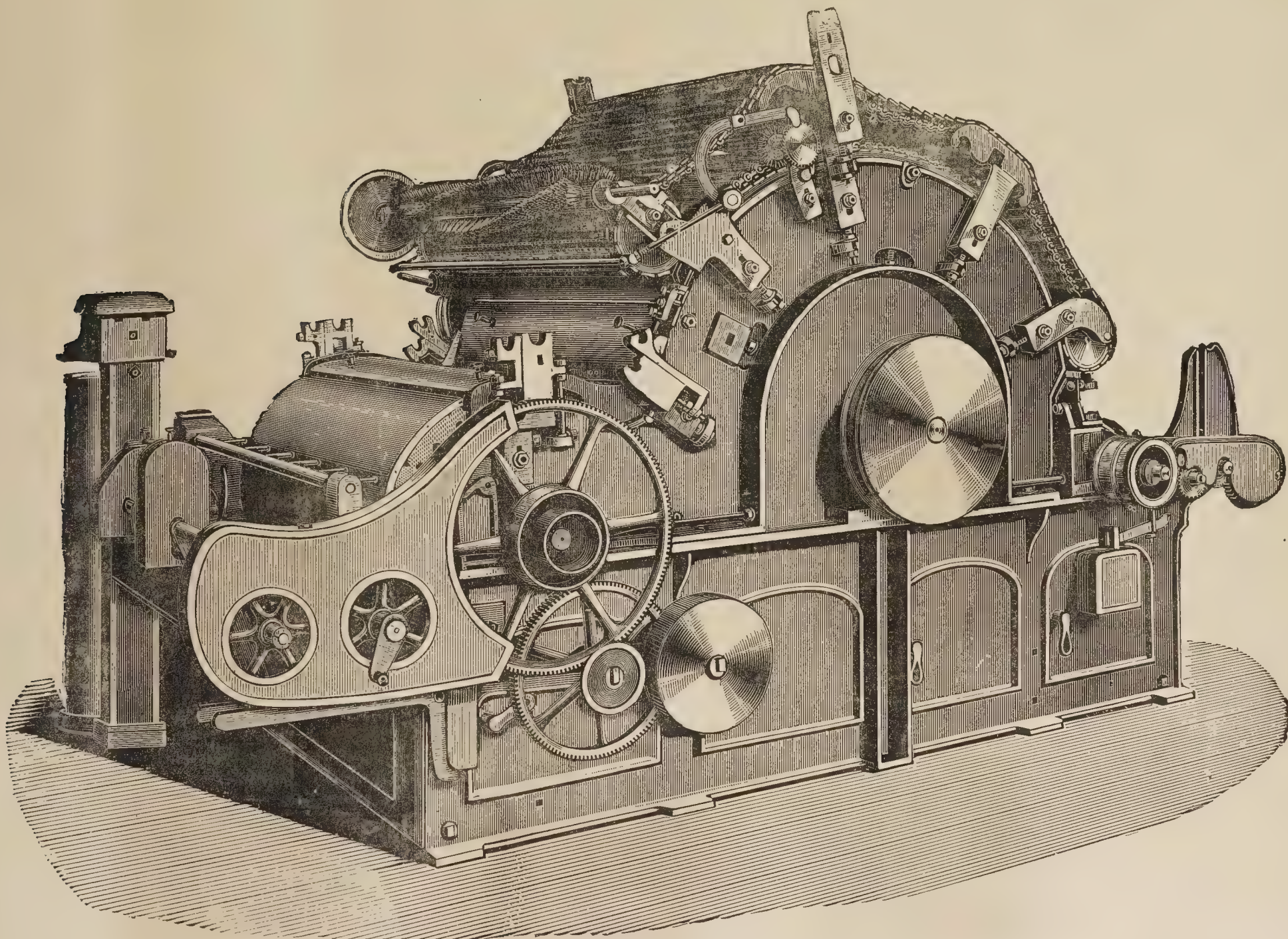
Advances are being made from time to time in the development of the various machines in use in the production of textiles, old systems are being continually improved upon, in minor details, which end in a nearly perfect mechanism. The apparatus we describe below, and which the firm of Mr. J. H. Stott, Baron Street, Rochdale, has for some time past made a leading feature of their business, affords a good instance of how machinery, once thought efficient, can, by experiments in actual working, be brought to a point of greater efficiency. By the invention of the sectional warping mill, a considerable saving of labour has been effected, as much as 75 per cent. in wages being saved in some classes of work, and numerous other advantages have been secured. The sectional warping machine illustrated, possesses features which render it more efficient in its work than those that have been made by Mr. Stott during the past two or three years, although they have been considered, by users of this class of mechanism, the best of their kind. The object the inventor has sought to attain has been that all the sections which go to make a warp shall be equal to each other in diameter, and shall each contain the same length of yarn, wound with a perfectly uniform tension. The latter is important, because, should any difference exist in this respect,

ing the friction bowl against this plate, instead of the first, the direction of the winding can be reversed, and the selvage ends placed outside. Exactly the same process serves for making pattern warps. The machine is fitted with a curved creel and a patent curved heck, which secures the uniformity of the length of yarn wound upon the series more perfectly than can be obtained by the employment of a straight heck. The heck eyes are made of cast steel, as hard as it is possible to make them. The half-beer leasing reed is fitted with a right and left-hand screw, by which means the width of the section is easily regulated. The measuring roller is 18 inch in circumference, and by a train of carrier wheels works the indicator. The section blocks are made solid, but, if desired by the purchaser, expanding blocks can be supplied. These, of course, obviate the necessity of keeping a large number of blocks in stock where various sizes of sections are made. In warping unsized yarns, the sections are balled off together by an ingenious balling machine, after which they are ready for the sizing process. In working coloured warps in which the sizing has been previously performed, they are run straight upon the loom beam in the ordinary manner. The machine in its improved form has already met with much success in silk, mohair, worsted, linen, cotton and cotton waste goods, and we have no doubt that this description will commend it to those readers interested in this class of machinery.

Improved Carding Engine.

The improved revolving flat carding engine illustrated is made by Messrs. Hetherington and Sons, Vulcan Works, Pollard Street, Ancoats, Manchester, a firm who have devoted special attention to machinery for the manipulation of cotton, and who have been actuated by a desire to place such machinery in the front rank in point of efficiency and general excellence. We may here state that this firm received a visit from the members of the British Association, on the occasion of their recent meeting in Manchester, when they were conducted through the works, and were enabled to witness the latest processes through which cotton passes from the raw material to the yarn, the firm having a variety of machines in practical operation. The carding engine under notice embodies many improvements, the chief of which relates to the principle of the "flexible bend," or arched plates. This is so arranged that, whilst giving the full amount of carding surface, the flats are shortened by about $5\frac{1}{2}$ inches, also the width of the machine over all, a reduction of friction being thus

parts in equal compression, it remains true when still further compressed to reduce its diameter to suit the wearing of the clothing. The flats are planed true on both edges, and are all made with the greatest accuracy by special machinery, and not only does each one pass an inspection, but they are tested by a machine which ensures that there shall be no variation as great as one-thousandth part of an inch. The cover for the doffer, and the front of the cylinder are made so as to go down to the proper point between them, without a loose filling-up piece, and are adjustable as the wire clothing is reduced by grinding. The cover is hinged in front, and is lifted forward for setting and grinding. The "taker-in-roller" is usually covered with inserted metallic filleting, and supplied with one or two mote knives, and with improved covered ends by which the selvages are improved. The cylinders and doffers are carefully turned and balanced, and, to ensure the greatest accuracy, are ground on the surface by an emery truing wheel, while in the balancing machine. The firm make carding engines of various sizes, the most usual being made with cylinder 50 inch diameter by 40 inch on the wire, with 24 inch doffer and 9 inch taker in. They have usually 105 revolving flats, and 42 of these are at work simultaneously.



Messrs. Hetherington & Sons' Improved Carding Engine.

effected. This result is obtained by placing the "flexible" inside the "bend" next to the revolving cylinder, instead of outside, as is usual in some carding engines. This new arrangement of the flats overcomes a serious defect viz.,—the difficulty of insuring accurate construction in the surfaces of "flexible bend" over which the flats travel. There has always been a difficulty in making the flexible bend perfectly concentric with the card cylinder. The usual method has been to turn the flexible bends in a lathe to a circle as nearly as possible the same as that along which the flats should travel, and then to spring these bends by setting screws to approximately the adjustment required. It is evident that this system is imperfect, and experience proves that very few of the flats are ever at the best working distance from the cylinder. Messrs. Hetherington and Sons have a patented method of turning the "flexible bends," absolute accuracy being obtained in the following manner:—The bends are first turned in a lathe to a diameter larger than required, and are sprung inwards in their place on the card till each particle of metal in the flexible bend has the same strain upon it. Weights are then hung upon the flexible bends between their supports, and these equal the weight of the flats when at work. A milling or grinding machine is attached to the main cylinder, which is caused to revolve slowly, while the circular cutter of the milling or grinding machine operates on the upper surface of the flexible bends, making them perfectly concentric with the cylinder. As this truing is done with the flexible bend having all its

Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the five weeks ending Saturday, October 29th, was 428. The number in the corresponding five weeks of last year was 469, showing a decrease of 41, being a net decrease in 1887, to date, of 18. The number of Bills of Sale published in England and Wales for the five weeks ending Saturday, October 29th, was 1,356. The number in the corresponding five weeks of last year was 1,254, showing an increase of 102, being a net increase, in 1887, to date, of 272. The number published in Ireland for the same five weeks was 57. The number in the corresponding five weeks of last year was 79, showing a decrease of 22, being a net decrease, in 1887, to date, of 214.

The standard money of the Congo Free State is the franc subdivided into 10 centimes.

PATENTS.

Applications for Letters Patent.

Apparatus for, and means of, preventing the picking bowl leaving the tappet point in looms. J. Williams and T. Callow, London.	6th Oct. 13,533
Automatic stop and let down motion combined for ring frame. J. Vaughan, J. Walker and T. Wolstencroft, Ashton-under-Lyne.	13th Oct. 13,855
Applying rollers to textile machinery. W. A. Whitehead and H. Midgley, Bradford.	22nd Oct. 14,375
Bobbins or spools for spinning and winding warp and weft and for the shuttles of looms and appliances used in manufacture of the bobbins or spools. R. and W. J. Wailes, Halifax.	3rd Oct. 13,337
Bobbin for lace machines. J. Jardine, Nottingham.	7th Oct. 13,584
Boilers. T. A. York, London.	27th Sep. 13,060
Bleaching and finishing textile fabrics, yarns and fibrous substances. J. S. Knott, Levenshulme.	14th Oct. 13,944
Battering, raising, or getting up the pile of sealskins, etc. H. Lister, Huddersfield.	18th Oct. 14,089
Buffers for weaving made from "waste" short picking bands. T. Catlow and W. Atherton, Bradford.	18th Oct. 14,103
Changing the shuttles in looms. C. Holdsworth and J. Horton, Halifax.	30th Sep. 13,237
Checking the shuttles in looms. R. Boothroyd, G. Thornton and J. Haigh, Halifax.	10th Oct. 13,686
Combing machines. J. C. Mewburn, London.	10th Oct. 13,708
Construction of portable hand pumps for putting out fires. S. B. Wilkins, Edinburgh.	7th Oct. 13,589
Cylinders of drying machines. L. Bridge, Halifax.	15th Oct. 13,989
Carding engines. D. B. Briggs and W. Eastwood, Bradford.	27th Oct. 14,614
Doubling and twisting yarns. J. Farrar, Halifax.	5th Oct. 13,473
Dispensing with the use of check straps in looms. J. Marshall, Halifax.	12th Oct. 13,801
Doubling and twisting. H. B. Arundel, London.	12th Oct. 13,820
Dyeing wool tops, and apparatus therefor. A. J. Boulton, London.	13th Oct. 13,896
Dyeing, bleaching, impregnating and otherwise treating yarn in bobbins and cops. F. R. Kothan, Manchester.	18th Oct. 14,092
Dobbies. C. Catlow, Halifax.	19th Oct. 14,178
"Divider" for dividing the threads or slivers in condensers or carding engines. J. Stanhope, A. Maud and J. W. Hainsworth, London.	20th Oct. 14,265
Dyeing wool and woollen cloth and yarn and all textile materials, either in the raw state, the process of manufacture, or manufactured, a fast and fadeless woaded green and other colours. P. H. Booth, Gildersome.	25th Oct. 14,485
Dobby for operating the healds of looms. R. H. Place, Halifax.	26th Oct. 14,573
Dividing slivers from carding machines. G. Lamparter, London.	26th Oct. 14,607
Electric spinning and twisting machines. A. S. Kimball and G. L. Brownell, London.	11th Oct. 13,736
Feeding wool, etc., to carding machines. J. E. Shaw and J. Davidson, Halifax.	10th Oct. 13,687
Fallers and hackle gills used in screw gill boxes for combing, preparing or dressing textile materials. M. Holroyd, Bradford.	22nd Oct. 14,373
Footsteps for spindles of ring spinning and doubling frames. W. Bodden, Manchester.	5th Oct. 13,478
Fuel economiser for steam generators. J. C. Jopling, Sunderland.	24th Oct. 14,413
Governors for steam engines. E. D. Skelton, London.	10th Oct. 13,711
Gas engines. T. B. Barker, London.	15th Oct. 14,027
Heckling machines for combing or dressing flax, etc. G. Lowry, Barnsley.	26th Oct. 14,570
Imprinting marks and devices upon folded piece goods, and apparatus. J. A. Cundall, Manchester.	3rd Oct. 13,358
Jacquard apparatus. S. Holdsworth, London.	28th Sep. 13,155
Jack joints for looms. W. H. Hudson, London.	20th Oct. 14,266
Looms for weaving and cutting pile fabrics. O. Drey, Manchester.	3rd Oct. 13,347
Looms. F. Senior, Huddersfield.	3rd Oct. 13,363
Looms. P. A. Staley, London.	3rd Oct. 13,384
Looms. T. Cotton and W. H. Thompson, Halifax.	8th Oct. 13,640
Looms. H. H. Lake, London.	15th Oct. 14,026
Looms. T. E. Aldrich, London.	18th Oct. 14,088
Looms. J. McMurray, Glasgow.	21st Oct. 14,342
Looms. G. M. Wilson, London.	21st Oct. 14,352
Leathers for drawing off wool, &c. H. Kershaw and D. Todd, Bradford.	18th Oct. 14,104

Lace-making machines. J. Wilson, Glasgow.	21st Oct. 14,310
Machine comb circles. J. and J. Dunlop and A. Smith, Bradford.	8th Oct. 13,625
Mules for spinning. H. Ashworth, London.	8th Oct. 13,633
Manufacture (improvement in) of cards for carding fibrous materials and machinery therefor. Executors of C. Moseley, London.	13th Oct. 13,907
Operating the feed knives of combing machines. J. W. Firth and M. Shackleton, Bradford.	10th Oct. 13,689
Putting up damask and other fabrics and novel devices for holding them when put up. J. G. Elliott, London.	11th Oct. 13,763
Producing variegated or fancy yarns. T. A. Boyd, Glasgow.	25th Oct. 14,477
Printing on cloth, &c. N. W. Helme, R. Stockdale and R. N. Helme, Manchester.	26th Oct. 14,563
"Perpetuals" or cloth dressing machines. W. Armitage and J. Thompson, Halifax.	26th Oct. 14,572
Rigging woollen, &c., fabrics, or facilitating the winding on boards. H. H. Lake, London.	7th Oct. 13,615
Raising cut pile fabrics. W. Evans, Manchester.	13th Oct. 13,068
Roving or intermediate frames for preparing fibres for spinning. W. P. Thompson, Liverpool.	13th Oct. 13,898
Rings of ring spinning and ring doubling frames. H. Rothwell and F. Leech, Manchester.	19th Oct. 14,189
Retting, ungumming, washing, &c., rheea, ramie or China grass, hemp, jute, flax and certain other fibres. H. M. Girdwood, Manchester.	19th Oct. 14,196
Ring spinning, doubling and twisting fibres and yarn. W. Lancaster, Halifax.	20th Oct. 14,254
Ring spinning and apparatus therefor. T. E. Wilson, London.	21st Oct. 14,355
Shuttles for looms. R. Greenwood and W. Tait, Glasgow.	29th Sep. 13,189
Shuttles for textiles—applies to shuttle tongues or spindles requiring taking out whenever there is a change of bobbin. S. Whitworth, Rochdale.	30th Sep. 13,238
Self-acting let-off motions. R. Hunter and J. Huggan, Glasgow.	30th Sep. 13,259
Spindle holder for ring spinning and doubling. J. and J. Vaughan and J. Walker, Manchester.	3rd Oct. 13,340
Scotch Carpets known as Kidderminster. J. Cuthbertson, Glasgow.	4th Oct. 13,405
Sliver cans. J. Sutcliffe and E. Ashworth, Manchester.	15th Oct. 13,998
Standard reel for packing and exhibiting sealskins, etc. H. R. Lister, Halifax.	19th Oct. 14,176
Skewers and shuttle tongues. J. Wallwork, Ashton-under-Lyne.	20th Oct. 14,239
Self-acting fluzing or curling, required in frames before doffing the bobbins, instead of doing it by hand. J. Ellison, Bolton.	20th Oct. 14,240
Strengthening and connecting the ends of double looped cotton bands used in machines for spinning and doubling fibrous materials. S. Rowbotham, Huddersfield.	20th Oct. 14,277
Spinning, roving or twisting machines, applicable to the manufacture of fancy worsted yarns. J. O. O'Brien, Manchester.	25th Oct. 14,501
Stop-motion for doubling frames. G. Ashworth, Manchester.	26th Oct. 14,564
Shuttles. T. Webster, Leeds.	27th Oct. 14,618
Testing and cleaning cotton and other thread. H. Offroy and C. Pfeffer, London.	29th Sep. 13,220
Twisting and doubling yarns. J. Robertshaw, W. H. Shaw and F. Shaw, Halifax.	6th Oct. 13,527
Treating bark of rheea or China grass, etc., and apparatus therefor. E. Caspar, London.	15th Oct. 14,034
Unshrinkable fabrics. T. H. and H. Blamires, Huddersfield.	15th Oct. 13,980
Variable automatic feed or driving motion. F. M. Ketton and C. W. Hollis, Nottingham.	18th Oct. 14,115
Weaving. J. Edelston, Manchester.	8th Oct. 13,645
Washing, cleansing, finishing engine waste, etc., and apparatus for collecting same. J. H. Williams and M. W. Hydes, Liverpool.	12th Oct. 13,611
Winding frames. L. Haslam, C. Marshall and T. Brown, London.	20th Oct. 14,267
Woven fabrics. B. Barraclough, Bradford.	24th Oct. 14,409
Yarns from hair, etc. J. J. Delmer, London.	10th Oct. 13,727

Patents Sealed.

11,545	11,755	1,280	4,651	8,803	9,395	12,430	6,464
11,374	11,547	11,812	12,168	12,290	13,624	4,833	9,662
12,286	12,431	12,445	12,501	12,543	16,998	2,355	9,089
9,139	9,189	10,035	10,432	11,736	12,090	12,812	9,516
11,212	11,284	12,704	12,814	12,894	16,787	5,895	8,911
8,178	12,952	13,204	15,377	7,024	9,720	9,722	5,811
11,576	11,866	12,328	13,054	13,122	13,362	13,430	5,070
8,575	11,858	11,890	12,449	12,615	1,426		

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How far do our Technical Schools Fulfil their Functions?

Now that technical schools and classes have had several years of trial in many centres, and are being continually increased, it may not be out of place to examine to what extent their work is being carried on, and whether the system, and the course of instruction adopted, can be improved. The matter is of importance both to existing schools, and also to towns contemplating the establishment of such institutions. First, it would be well to clearly understand what are the functions of such schools. There is no doubt the necessity for their existence has arisen from two causes—first, the practical abolition of the apprentice system, and the great sub-division of labour in the factory system; and, second, the necessity for a higher scientific knowledge of the manufacturing processes. Then technical schools must aim at giving their pupils a practical knowledge of all the processes connected with their craft, and a knowledge of the scientific principles upon which they must work. That the schools which have been established are aiming at this latter work there can be no doubt, but there is also no

doubt that the practical portion is neglected. There are numbers of classes in existence in the textile trade where the loom is never resorted to at all, either for demonstration or for acquiring a practical knowledge of weaving. There are, also, large numbers of students in schools which offer every facility, who seldom go near a loom. Herein lies one of the greatest weaknesses of the teaching as carried on. No sound knowledge can be acquired without demonstration; the pupil becomes a mere theorist. He may be able to produce any number of so-called designs on paper, but, having little or no knowledge of their practical application, they are of no value. In the first place, unless he makes himself thoroughly familiar with the machine which is to produce the fabric from his design, he cannot know how to utilise it to the utmost. He may waste a considerable amount of the powers of production, and even of actual material. And in the second place, if he has not carried his designs into cloth, he can have no idea of their suitability for the production of one class of fabric or another. Again, this may be carried further; as every practical designer knows, there are many designs produced upon paper which may look very pretty, but which are utterly impracticable as applied to cloth, and this may arise from such a variety of causes that, if any teacher were to attempt to describe and enumerate them to his pupils, it would be utterly impossible for them to retain the matter in their memories, even if they could be made to understand them. It then necessarily follows that, if one portion of the work only is carried on, the system of training is not complete, in fact, it may be misleading. But we may be met with the reply that most of the pupils are actually engaged in the mill in the very operations which constitute the practical part of the work. That may be quite true, but only in comparatively few instances. The great majority may be employed in the mill, but the nature of their employment confines them to one operation, or to one set of operations only, therefore they have not the time to acquire a knowledge of the other operations necessary to the successful carrying on of their work; and, if the schools are established to supply the requirements of the apprentice, this is an important matter. The question may then arise—If there is an omission, who is responsible for it? The answer must be, the pupils themselves. If in schools where the governors have not provided facilities for the practical demonstration of the theories taught, and a demand arose for it, there is no doubt it would be supplied; and in schools where facilities exist, and the pupils do not avail themselves of them, the fault is clearly their own, and they are allowing themselves to be deluded by an idea that they see enough of the practical work in the mill. Unless a pupil is in such a position in a mill as to have an opportunity of seeing designs of almost every variety and character actually carried out in the cloth, and can have a knowledge of the character, weight, and quantity of the yarns employed, all the knowledge he can acquire of placing designs upon paper will be of little avail to him. There can be no doubt that the schools which have been established are doing admirable work, and it is equally certain that the practical portion of the work, the value of which cannot be over-estimated, is very much neglected by the pupils themselves, and whenever it becomes necessary for them to apply their theories to practice, the lack of knowledge will be felt.

Chilian Woollens.

According to a Consular report received from Valparaiso (Chili), Mr. Consul Newman has forwarded two packets containing samples of various woollen cloths manufactured in the country, which have been handed over to the Dewsbury Chamber of Commerce, together with information respecting them. The report is devoted to useful details regarding these specimens, and other saleable productions. Merchants there complain that English manufacturers do not cater for the changes in the requirements of the markets to the same extent as some of their continental competitors do, and the result is that goods of regular consumption, which seldom change in character, are imported chiefly from England, but, as the Chilian market requires incessant changes, those which constantly vary in design or make, and which call for manipulation, as well as good taste in their production, are imported principally by continental houses.

Thibetan Wool.

A short time ago, we gave particulars of a consular report bearing upon the value of Thibetan wool. Several of the Yorkshire Chambers of Commerce at the time were considering a communication from Mr. Consul Warry, of Darjeeling, in which a sample of wool was enclosed. In India, the Government appear to have been seeking information, not only regarding Thibetan wool supplies but, also, as to the improvement of Bengal wools. In reports on the external trade of Bengal with Nepaul, Sikkim, and Bhotan, it is stated that the quantity of wool available for export from Thibet is believed to be enormous. Between Kamba and Shigatse, within a march and a half of the Sikkim frontier, at the head of the Lachen, sheep are killed, not for the sake of their hides or fleece, which are practically valueless for want of a market, but, in order that their carcasses may be dried into jerked meat and sold for eight annas each. At Kamba itself, carpets and rugs are manufactured of the finest quality, and of patterns evincing excellent taste and skill, but there is no outlet for these fabrics. Further north of the Great Chang Thang (or northern plateau), which begins just beyond Sanpo, within five marches of the Kongra Lama, are prodigious flocks and herds which roam at will over the endless expanses. The statement of imports of wool into British territory from Sikkim and Thibet for the past five years show that they have ranged as follows:—1882-3, 13,440 lbs.; 1883-4, 72,880 lbs.; 1884-5, 7,280 lbs.; 1885-6, 204,400 lbs.; and 1886-7, 154,640 lbs. The falling off in 1884-5 has been attributed to the difficulties placed in the way of the trade by Thibetan officials, but Mr. Finucane points out that, though this may be one of the true causes of the decline, it is to be noted that the trade appears to have been at all times irregular, for, coincidently with the falling off in wool imports, there was an augmentation in the case of other articles, for instance, in musk and yak tails, which increased in value from 11,487 rupees in 1883-4 to 142,954 rupees in 1884-5. Without, however, questioning the existence or the pernicious effects of restrictions placed by the Thibetan officials on the frontier trade—matters on which Mr. Finucane had no knowledge, and no special sources of information—he says that, having made some inquiry on the subject at Darjeeling, he has neither seen nor heard anything which would lead him to doubt that a considerable trade in Thibetan wool can be developed, even under existing conditions, by simply creating a steady demand, and securing a constant sale for the article in Darjeeling. In a letter from Mr. Spencer Robinson, it is stated that a merchant trading with Thibet has recently offered to deliver to that gentleman in Darjeeling ten thousand maunds of wool, provided he guaranteed the purchase of it at Rs. 16 per maund. The Thibetans, he adds, will not place any obstacle in the way of allowing the wool to come through. If the wool can be delivered at Darjeeling at Rs. 16 a maund, or say, 3d. to 3½d. per pound, and the wool is worth in England 6½d. to 7d. per pound, as it is believed to be, there would appear to be little doubt that the existence of a steady demand at Darjeeling, or some other place nearer the frontier within British territory, would lead to a steady supply so far as the resources of Thibet allow. Mr. Finucane then says, “I am not here arguing against the desirability of removing trade restriction—a question which does not come within my province, and on which I am not called upon to offer an opinion—but what I am arguing in favour of is the creation of a steady demand for Thibetan wool in Darjeeling by establishing an agency, public or private, for the continuous purchase of it. The attempts being made by Mr. Spencer Robinson, who has, I am informed, much practical knowledge of the subject, will, from this point of view, be watched with much interest.” From a report by the Bengal Chamber of Commerce, and from the Secretary of the Agri-Horticultural Society, it seems that Thibetan wool, judged from a sample received from Mr. Spencer Robinson, is supposed to be worth 6½d. to 7d. per lb. in England. If this estimate turns out to be correct, and wool be forthcoming from Thibet in large quantities, as stated to Mr. Spencer Robinson, the importation of wool from Thibet should be a highly remunerative business. In concluding, the Director of the Agricultural Department makes the following recommendation:—“That arrangements may be made by which a steady demand and sale can be guaranteed for Thibetan wool in Dar-

jeeling or elsewhere within British territory; such demand will create the supply, and will probably arise without the aid or interference of Government, when it is known that wool is forthcoming. If, in addition to this, the Government of Thibet can be induced to remove restrictions which must, as a matter of course, injuriously affect trade, all the better, but I am not in a position to offer an opinion on this point. Further, it would perhaps be at first desirable to allow specially favourable rates for carriage of wool from Darjeeling by rail to Calcutta, and orders to have this done have, I understand, been recently issued. It would also be well, if possible, to improve the means of communication by road with the Thibetan frontier.” This additional information is encouraging, and would seem to warrant the hope that the reasonable manner in which the subject has been approached by those replying to the “demi-official” inquiries of the Government will lead the department or departments, with whom the power lies, to the taking of such steps as will render any extended trade operations with Thibet, in the future, secure from the influences which have hitherto made it fluctuate so largely and detrimentally.—*Chamber of Commerce Journal*.

Commercial Museums.

A museum has been established at *Antwerp*, which is destined to serve the interests of commerce, industry, and ethnography. For the information of both Belgian and foreign trade, samples of national and foreign industry will be exhibited with an indication of the place of production, and the conditions of sale. The management of the museum asks, therefore, all home and foreign manufacturers to forward their samples, price lists, and all other information, the public exhibition of which might be useful to them. It is also intended to make a complete collection of sea charts, and the most recent information about all ports of the world shall be obtainable at the museum. At the closing meeting of the second congress of the *Syndical Chambers of France*, held in Paris on the 12th of November, the resolutions passed by the various sections came up for confirmation. Amongst other recommendations for the improvement of trade was the following:—Considering that it is most important to make known, not only the goods which we produce ourselves, but, those as well which compete with ours on all markets; Resolved:—That commercial and industrial museums should be created exclusively and essentially composed of (1), raw materials necessary to industry and of foreign origin; (2), all products manufactured and consumed in foreign countries. The *French Minister of Commerce and Industry* has transmitted to the commercial museum of Lille a batch of samples of textiles and hosiery, collected at *Port Louis* (Mauritius), by the president of the French Consultative Commercial Committee, on the request of the French Consulate. The *Technological, Industrial, and Sanitary Museum of New South Wales*, which was founded in 1880, is intended to occupy a similar position, and, to fulfil the same purpose in the Colony as the South Kensington Museum, the Bethnal Green Museum, the Museum of Practical Geology, the Patent Office Museum, and the Parkes Museum of Hygiene do in London. For this purpose, it is proposed to bring together typical collections of all materials of economic value belonging to the animal, vegetable, and mineral kingdoms, from the raw material, through the various stages of manufacture, to the final product or finished article ready for use. With this view, exhibits will cover animal, vegetable and waste products; foods; economic entomology; economic geological specimens showing the ores of metals, their manufacture and uses, and the same in regard to other branches; chemical and pharmaceutical products; educational apparatus and appliances; sanitary and hygienic appliances and systems; mining, engineering, machinery and metallurgical products; military and naval armaments, agricultural tools, appliances and machinery, and soils, manures, &c.; specimens illustrative of miscellaneous manufactures not included in the foregoing, together with models, drawings, samples of historical furniture, and of artistic workmanship in iron or other metals. Exhibition catalogues, trade journals, price lists, and descriptions of new processes or industries will be kept for reference in the library and reading room, which will form a part of the museum. Series of specimens illustrating all the stages of a manufactured article are especially desired. Mr. J.

H. Maiden is the curator and secretary of the institution, and, in making the objects of the museum known, he has distributed prospectuses in English, French and German. From a catalogue of the collection, as it stands at present, the elements of a very successful commercial museum appear to have been already obtained, and we venture to think that those who are in charge could not extend their operations in a more useful direction, or in one really likely to convey education of a more practical kind, than by building up the branches referring to industries on the basis of conveying information to those seeking to extend either the import or export trade. The *Moniteur Industriel* states that the Roumanian Minister of War has taken the initiative in creating at Craïova, in the premises of the Military School, a *permanent industrial museum*, which will contain exhibits not only of Roumanian productions, but also those of foreign origin. An *exhibition* of textile goods and machinery is to be opened at *Warsaw* about the middle of this month, which may afford a good opportunity of increasing the importation of British goods of this class into Poland. The articles which are specially suited for the market are:—Cotton yarns and threads of high numbers, cambric, serge, Irish light linen, Scotch tweeds and fancy cloths, silk stuffs and dyes, beltings, and all kinds of textile machinery. Under the various sections, provision is made for exhibiting all these productions, and those who desire to participate, should communicate with the Warsaw Branch of the Russian Society for the encouragement of Trade and Industry, the offices of which are in the Faubourg de Cracovie.

Linen Bleaching.

The pieces of goods are sewn together and then brought into the fermentation tub. Each length is saturated with river water, warmed to 110° F., and then trodden down by foot (with wooden shoes), that every part may be equally saturated. It is laid into the tub in this manner until it is full. Then boards are laid over the tub, fastened by a cross-board, not only bound by a chain, but held by a beam reaching to the roof. When the linen is thus securely fastened, it is completely covered with water, and left for the acid fermentation to take place. This is ended in about forty-eight hours. The goods are then thoroughly washed and spread in the bleaching field. They are allowed to lie here from two to three days, and water poured upon them as often as they dry. They are finally taken up dry and given the first boil.—*First boil*.—The tubs have double bottoms, and are wooden tubs sunk in the ground, and so placed that the lye from the kettle can run directly in, the lye from beneath the false bottom can be pumped out, and warmed and allowed to run upon the goods again. The lyes are prepared from one pound of calcined soda and one hundred pounds of water. This is often replaced by a potash lye of equal strength, or of a mixture of potash and soda lyes. The goods are introduced and trodden down until the tub is full. Then water is run in until the goods are covered. The lye warmed to 110° F. is now added until the strength is one per cent. at the top. The lye from below the false bottom is pumped continuously back, and allowed to flow on to the goods, and the heat very slowly raised until 212° F. is reached. Then the fire under the kettle is allowed to go down, but the pumping is continued until the fire is out. The goods can be allowed to cool in the lye, or the lye to be drawn off, and cold water run on. They are then spread on the bleaching field for two or three days, and wet as before; they are then ready for the second boil.—*Second boil*.—This is simply a repetition of the first boil in every way. After drying on the field, the goods are given the *Third boil*.—The lye is weaker in this boil. It is represented by 1 pound of soda to 140 pounds of water. After the boil, cold water is run into the tub until the hand can be borne in the liquor. The goods are then laid on the bleaching field with the adhering liquor.—*Fourth boil*.—As before, except 1 pound of soda to 150 pounds of water.—*Fifth boil*.—As before, except 1 pound of soda to 160 pounds of water.—*Sixth boil*.—As before, with 1 pound of soda to 170 pounds of water.—*Seventh boil*.—As before, with 1 pound of soda to 180 pounds of water.—*Eighth boil*.—As before, with 1 pound of soda to 190 pounds of water.—*First sour*.—The goods are taken wet from the bleaching field and washed, well

worked and loosely laid in an oil of vitrol bath, containing 1 pound of acid to 200 pounds of water, and allowed to lie in this bath from five to eight hours. They are then taken out, washed in running water, and given the *First chlorine treatment*.—The bath is prepared by dissolving 1 pound of bleaching powder in 600 pounds of water. The goods are placed loose in stone tanks, and treated with the bleaching solution, and kept under by sticks. The goods are kept in from six to eight hours. They are taken out, washed in running water, and given the *second sour*, which is simply a repetition of the first.—*Ninth boil*.—The bath contains 2½ pounds of tallow soap and 1 pound of soda in 600 pounds of water of from 110° to 175° F. They pass after this boil to the bleaching field for two to three days, and are then washed and examined. The goods designed for a half bleach are now starched, or blued and dried. Those to be three-quarters, or fully, bleached are now washed as long with white, or brown soap, as any black or yellow places remain to be whitened; they come impregnated with soap to the *Tenth boil*.—In this, a solution of 1 of pound soda in 300 pounds of water of 110 to 170° F. is used. The goods then go to the bleach field, but are laid on boards instead of the grass, kept wet, and at the end of 2 days given a *second chlorine treatment*, which is just like the first, and is followed by the *third sour*, after which the goods are given the *Eleventh boil*—in which 1 pound soda, 2½ pounds tallow soap, and 600 pounds water of 110 to 170° F. are used. After the usual exposure on the bleach field, the goods are sorted, and those perfectly bleached removed. Those still imperfectly bleached are given *another boil*, a *third chlorine treatment*, and a *fourth sour*.—*Wochenschrift für Spinnerei u. Weberei*.

Silk Dyeing with Anilines.

Silk was the first fibre to which the coal-tar colours were applied. The ease with which they can be applied led to this early introduction, and even at the present time the use of anilines in silk dyeing is more nearly universal than in any other branch of the trade. The silk must be carefully washed with soap. The vats should be of wood, but are usually much smaller than those used for cotton and wool dyeing. The common temperature for the dye-bath is 120° F., and the most brilliant shades are obtained at this temperature. Most of the anilines unite directly with silk fibre, forming apparently new chemical compounds. The use of a true mordant is seldom necessary. Assistants in the bath are freely employed. Neutral colours are usually dyed in a soap-bath, and it can be the same bath used for washing the silk. Acetic, or tartaric, acid is occasionally used to brighten the shade. The colour should be added to the bath in small portions, to give evenness to the shade. Fuchsine is freely used alone and in mixtures. Safranine is largely used alone for pinks and with yellows to give scarlets. The temperature of the bath should not exceed 90° F. The most beautiful shades are obtained in a soap-bath. Methyl violets are also very much used; the temperature should be about 100° F., and a small addition of tartaric acid improves the shade. Aniline blues are brightened by the addition of tartaric, or sulphuric, acid. They should be dyed at 110° F. Aniline greens (best methyl green) should be coloured with acetic acid in the bath at 100° F. Perhaps the most brilliant shades are obtained with the acid colours. They are always used in a soap-bath, to which acetic, tartaric, or sulphuric, acid is added. They are not fixed without acid. The yellows and oranges are very important. Acid violets, acid fuchsine, and acid blues, are freely employed. Alkali colours are seldom used. Colours and shades are very common which consist of mixed anilines. The olives are good examples of these. The following combinations are illustrations:—(a) Acid yellow, nine and one-half ounces. Orange, one and one-half ounces. Blue, eight and one-half ounces. Silk, one hundred pounds. (b) Orange, nine and one-half ounces. Brilliant green, six ounces. The use of woods and all colours except anilines upon silk, is very limited, except in dyeing blacks.—*Textile Record*.

The Cape Colony (South Africa) Parliament looking forward to the founding of woollen factories in addition to the one established by Mr. A. W. Dickson and in operation at Ceres, near Cape Town, has decided that all woollen machinery imported into the Colony shall be exempt from duty.



The Self-Acting Mule.

A lecture was recently delivered by Mr. John Clegg, head of the mule department at Messrs. Asa Lees and Co., Limited, Oldham, on the self-acting mule. Mr. Clegg prefaced his lecture with the remark that we were in front, as yet, both in machine making and in cotton spinning, but our Continental rivals were treading close upon our heels, and the Germans in particular displayed an aptitude for technical knowledge and theoretical training, while Englishmen, who were more practical, had not attained to the same degree of education. In Germany, attendance at evening schools was compulsory, and we in this country needed some system of secondary education. Cotton spinning, he was sorry to say, had not been very flourishing during the last few years. We produced in order that we might consume, and we exported in order that we might import, and if trade was slack there was a cause for it. As to the self-acting mule, it had lately had a rival in the ring frame. Which of these two machines was the more useful, or would make the most money, was a difficult problem to answer. The ring frame would spin from 16's to 36's, but its yarn was harsher than that of the mule, and did not do for every kind of cloth. It would not receive delicate tints of colour as mule frame yarn would. The ring frame took 50 per cent. more driving, and a plant of this kind cost double that of a mule plant, so that he contended if the ring frame could not beat the mule more than six hanks, the mule was the cheaper. The question to be considered was which was the more profitable investment? and, looking at it in that way, he believed the mule was the better. The ring frame would always be used for certain yarns, because it would replace the old throstle frame. Proceeding to the immediate subject of the lecture, Mr. Clegg said that, in order to have good spinning, they must have good roller covering, and, if they were fast bosses, the grain of the leather must lie the same way. He believed that, if the rollers were well covered, fast bosses would make a better thread than any loose bosses ever made. Loose bosses might come in when they had bad roller covering or careless minders. For good spinning there was nothing to beat the Bolton system of one thread on a boss. Then as to the weights on the rollers, he believed that if there had been a good system of making levers years ago, there would never have been any dead weights. Owing to the higher rates of speed, weights were becoming heavier every year, and mills, which started with 3lb. weights five or six years ago, were now putting on 4lb. or 5lb. Sometimes mules were sent out with soft and sometimes with case-hardened rollers, but he did not think a case-hardener roller was worth putting in except for special work like that of Bolton: for ordinary spinning, a hardened bottomed roller was worse than a soft one. Spindles were now shorter than they used to be. Big warves were a mistake. They used to be from $\frac{7}{8}$ in., to 1 in., but there was no advantage in having the rim band or the spindle band running at a greater speed than was required. The smaller the wharve, the longer would the band last. Another point was to have the warves placed at the right height on the spindle, or they would be always troubled with the bands coming off. In setting a mule, the wharve and the centre of the tin roller must always be in a straight line. It did not matter whether the bottom of the carriage was level or not; it must be in the place where it would work best and give least trouble to those who had to work it. The self-acting mule was made for spinning not only cotton, but wool, cowhair, worsted, and flax. Some years ago, we used to have a good trade in spinning cotton waste, but the foreigners found that this kind of spinning must be done with one roller, and they had created a very successful trade. Germans now came over to this country and bought up the waste, which they carried over to Germany and brought back to England a manufactured article. The machine which the Germans used for this trade was made in England, but at first none of the English waste spinners would look at it. They found, however, that they had lost this trade, and they were now commencing to adopt this system, and machine makers were busy making this class of machinery. There was only one line of rollers in this machine, and these were simply used to measure out the length to be spun. The stuff was put behind the card, and it came through a kind of web,

and then went through a machine called a condensor. The sliver was divided into threads, and was then wound on to bobbins and went into the mule. The mule had a 72 in. draw. The rollers would deliver 48 in. and the carriage would draw it into 72 in. The spindles had three speeds, a slow speed at the commencement of the draw, a medium speed at the middle of the draw, and a double speed at the end of the draw, exactly as in wool spinning. These mules were run at the rate of about five draws a minute, and would produce rather more than 2lbs. per spindle of a nice level thread. The stuff was so poor and short that it had to be strengthened by putting twist in. Proceeding to speak of the ordinary mules for spinning medium numbers, he advocated the use of small rim shafts. Another important thing was to have the backing off right. One cause of snarls was that the click did not always get in motion at the same time. There was a positive motion for putting the click in, and if they got that they would have no trouble afterwards. As to the strapping motion, if it put the bottom of the cop in at three or four times, it would give a bottom full of snarls, and to make a good bottom, they wanted a motion which would put it in at about 40 times. There were plenty of strapping motions, and most of them would work if properly adjusted. A big change wheel was an advantage, because if the cotton varied a little they could make a little change in the wheel, and by that means master and man would work amicably together. A good machine should be so made that it would put out its best efforts for those who had to work it, while yielding the best results for those who had an interest in its profits. The wheel which altered the speed of the carriage should be a driven wheel, and not a driver, although that meant an extra wheel or two. With reference to the coping motion, he pointed out that lots of cops were condemned, not because it was bad yarn, but because it was badly wound. The tin roller was often put to run the wrong way, and the result was that it did not take the same number of turns as if it ran correctly, and the yarn was not so strong. If it was right, it would run in the opposite direction to that of the carriage as it was going out, and more twist was put in by that than the other way. In some mules the minders used a snarling peg. That meant that, though they were making the right number of draws, they were not drawing the right length for their employers, and it was worse for the minders.—At the close of the lecture several questions were asked, and Mr. Clegg replied to them. He explained that he objected to loose boss rollers because they cost more money, and would not draw as fast boss rollers would, so that if an uneven roving came, it made an uneven yarn. With reference to the difference in price between ring frame and mule yarn, he pointed out that there had been a rise in mule yarn to the extent of $\frac{1}{4}$ d., while ring frame yarn had gone up only $\frac{1}{8}$ d. He believed that in the next few years there would be such rapid strides in mule making, and they would be made to go so much faster, as to leave the ring frame altogether behind. Ring frame mills had made little profits of late, and in India, where the ring frame used to be largely employed, it was now going out.

Alumina Bleaching Compounds.

Hypochlorite of alumina has long since been employed in bleaching, under the name of "Wilson's bleaching liquid," and has been preferred on the grounds that "it accelerates the bleaching process and deteriorates the fibres of the tissue much less than the chloride of lime." Up to the present, the usual method of manufacture has been by double decomposition of alumina sulphate and chloride of lime. "Experiments have proved that similar but still more energetic bleaching compounds of alumina are produced by the direct action of chlorine on aluminates, and especially on aluminates of sodium or calcium and of magnesium, whereby the use of chloride of lime is entirely obviated. These bleaching alumina compounds may be prepared either in the form of a solution or in a solid form." Chlorine is passed through a solution of the aluminate or over the solid substance till no more is absorbed. The inventor claims that the alumina compounds prepared in the manner he describes act as very rapid bleachers "in consequence of the delivery of ozonized oxygen." "The use of acid baths is also dispensed with; also these alumina compounds deteriorate the fibre much less than chloride of lime."—R. Weiss, Oranienburg.

Railway Rates and Terminals.

As most of our readers are very strongly interested in the subject of railway rates and terminals, we give the following letter :—

To the Editors of the Journal of Fabrics and Textile Industries.

GENTLEMEN,—As the withdrawal of the Railway and Canal Tariff Bill of last Session defers any settlement of the railway rates question for some time, I trust you will allow me to call the attention of the trading public, through your columns, to the recent action of this Committee upon one of the most important points at issue between railway companies and traders, and its results. All traders are aware that it is the custom of railway companies to add to their charges for carriage considerable sums for "station accommodation." The contention of the traders is, and always has been, that the *maximum* rates authorized by nearly every railway company's Act of Parliament cover all services rendered by the companies from the time the goods are placed in their hands for conveyance, until they are received by the consignee (excepting, of course, when goods are warehoused for the convenience of the owners), and that such extra charges are, therefore, illegal. The contention of the railway companies is that the *maximum* rates only cover the cost of conveyance along their lines, and that they are at liberty to make further charges for "station accommodation" at the points of arrival and departure on their lines. Without entering into the merits of these contentions here, I may say that many cases upon this point have been contested before the Railway Commissioners, whose decisions have been in favour of traders, and that one important case, at least, has been decided by the House of Lords, also in favour of the traders (*Gidlow's*). In 1885, however, a railway company appealed in a case of this kind (*Hall v. London, Brighton, and South Coast Railway Company*), from the decision of the Commissioners, which had been given against them, to a Divisional Court, and the Commissioners' decision was reversed. In the same year, nine of the leading railway companies introduced Bills into Parliament for the purpose of increasing their *maximum* rates and legalizing terminal charges. These Bills were vehemently opposed by the traders, and at a meeting held to consider the best means of organising the opposition, the committee over which I preside was formed. The Bills being withdrawn, this Committee was subsequently resolved into a permanent Parliamentary Committee "to watch over the interests of trade and agriculture so far as affected by railway and canal legislation," and it was decided to take steps to obtain a final decision upon the question of terminals. The case of "*Hall v. London, Brighton, and South Coast Railway Company*" having been brought under the notice of the Committee, they, being sensible of the gravity of the issues involved, decided to carry the case to the House of Lords. The Court of Appeal, however, without entering into the merits of the case, decided upon purely technical grounds that no appeal lay from a Divisional Court. Mr. D. J. Kempson, of Birmingham, a member of this Committee, recently declined to pay the charges demanded by the London and North-Western and the Great Western Railways in two instances in which he had consigned goods by their lines, on the grounds that such charges were illegal, as they were in excess of the companies' statutory *maximum* rates. As the companies declined to carry his goods without payment of the amounts demanded by them, Mr. Kempson paid them under protest, and sued both companies in the County Court to recover the excess. The result of his action has been that in both instances the railway companies have paid the amounts, for which Mr. Kempson sued them, into Court. The rates which he declined to pay are, and have been in operation for some time, and it is obvious that, if the companies exceeded their powers in his case, they have done so in every instance in which traffic has been consigned over those portions of their lines to which these rates apply. In order that the extent of the overcharge may be understood, I give particulars of the rates :—London and North-Western Railway, Birmingham to Spring Vale siding, near Deepfield, iron undamageable, 8s. 4d. per ton, 9½ miles; Great Western Railway, Birmingham to Warwick, iron undamageable, 5s. 10d. per ton, 22½ miles. In the former instance, the overcharge amounted to 5s. 4d., or 64 per cent., and in the latter to 3s., or 51 per cent. of the rate charged. The Committee which I represent consider that the fact of two of the leading companies preferring to surrender rather than contest this important point further cannot be too widely known, and for this reason I venture to ask you to insert this letter.—I am, Sir, yours faithfully,

HENNIKER, Chairman.

The Railway Rates Committee, Eastcheap Buildings, E.C., Nov. 21.

The American Financial Question.

PRESIDENT CLEVELAND'S MESSAGE.

President Cleveland's Message, communicated to the American Congress, December 6th, deals only with the financial question. He says the money now exacted largely exceeds the sum necessary to meet the expenses of government, and that it is an indefensible extortion, and produces many evil consequences. He points out that, at the end of the present fiscal year, the surplus in the Treasury will amount to 140,000,000 dollars. The resources of the Treasury for dealing with the surplus have been exhausted, and it is necessary to remove the cause to prevent the recurrence of such a situation. The tariff laws, the Message says, are vicious, inequitable, and illogical.

They are the source of the unnecessary taxation, and ought to be forthwith amended. He goes on to show that only a very small proportion of the working classes are employed in industries which benefit by the high tariff. The president urges a considerable addition to the free list, declaring that the taxation of luxuries is no hardship, but that necessities should be greatly cheapened. He favours either a radical reduction of the duties on raw materials used in manufacture, or the free importation of such materials. It is not, he says, a question of free trade, and the suggestion made in certain quarters that the efforts to reduce taxation are the schemes of free-traders is mischievous.

THE SECRETARY TO THE TREASURY'S REPORT.

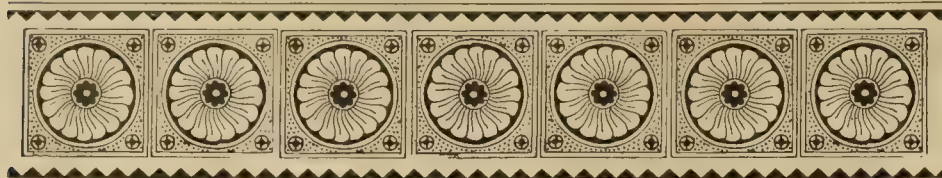
Mr. Fairchild, Secretary to the Treasury, in his annual report to Congress, states that he is indisposed to recommend the repeal of the Sinking Fund. The requirements of the present laws can probably only be complied with at a heavy cost. Still, it is better and more wholesome each year to devote such a sum as may be required for extinguishing as much of the debt as can be purchased therewith. Mr. Fairchild concurs with President Cleveland's views both in regard to the authority of the Treasury not to purchase bonds at a premium except for the Sinking Fund, and that the expenditure of the excess funds upon the requirements of the Government should be rejected. The reduction of the revenue from taxation is, Mr. Fairchild maintains, the only fit remedy for the evils which threaten the country, but he is not in favour of interfering with international taxation. The tariff should be reduced in the case of every article to the lowest possible point, as many articles as possible should be placed on the free list, and the abuses and inequalities in the tariff laws should be reformed, while bearing in mind the present situation of labour and business. The report proceeds to state that, after paying due regard to all the equities of the matter, and after providing for the observance of every obligation, it will be found that great reductions can be made, and that so many compensations can thereby be given to this or that industry, that most of them will find themselves in fully as good a state as now, and many in a much better condition. "Patient labour," adds Mr. Fairchild, "coupled with a firm determination to lay aside every consideration save the lasting good of the whole country, will enable Congress to accomplish its task with honour." The report then suggests remedies for the difficulties arising out of the ambiguities in the tariff schedules and Customs laws by revising and reducing the rates, which should be made specific instead of *ad valorem* as far as possible. Mr. Fairchild points to the necessity for the discrimination of duties on woollen and worsted cloths, and declares that the manufacture of the latter in the United States must cease unless the tariff is amended.

Book Notice.

"THE POWER LOOM AND THE ART OF WEAVING." By Alexander Brown.

Published by J. P. Mathew and Co., Dundee.

The value of this work will be understood when we state that it has entered its fifth edition. The copy now before us has been revised, and in many particulars brought up to date. It commences with a short introduction on the "reasons of the slow development of textile machinery," slow when contrasted with other machinery, some of which has been brought into existence, and developed to maturity, according to present ideas, almost at once. But, the author says, "considering the complicated nature of the power loom, and the difficulty in managing it—the whole of its movements being intermittent, and all more or less reactionary,—and the widely diverse nature of the manipulation of yarn and cloth, and the application of machinery to it, and how seldom a capacity for both is to be found in the same individual—an association being necessary before any advancement can be made,—considering all this, the tardy progress of the development of textile machinery will be more easily accounted for." The work then gives a thorough insight into the relative position of the principal parts of a loom; the shedding apparatus, the pick, the shuttle protector, the take-up motion, the pace, the speed, driving gears, &c. It then gives chapters on "how to start and work the loom, to find the number of splits or dents, and the quantity of warp or weft in a web, the preparation of the yarn for the loom, and draughts and treading. The instruction the work contains should be welcomed by all engaged in the weaving departments of the textile trades, as it gives, in a comprehensive and practical form, much solid matter. We may add that the numerous illustrations of the various branches of the subject dealt with enhance the value of the information. It is published at 3s. 6d.



ORIGINAL DESIGNS.

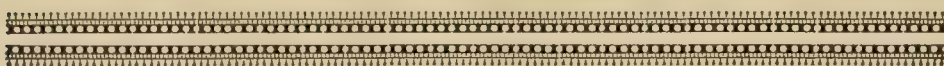
Our first plate contains a design for a Toilet Quilt.

* * * *

Our second shows a useful pattern, drawn by Mr. T. L. Peck, 2, Plumber Street, Dodworth Road, Barnsley. It is intended for a coloured Damask Table Cover.

* * * *

On our third plate, we give a design for Tapestry Fabric. This has been drawn by Mr. C. W. Sandiforth, 103, Race-common Road, Barnsley.



MONTHLY TRADE REPORTS.

Wool.—The London wool sales, which closed on the 10th inst, opened rather briskly; the demand, with few exceptions, has been good, and prices have ruled very firm; for the best qualities of wools extreme rates have been paid. The sales have been well attended by French, German, and other foreign buyers, and the competition for good lots between them and English buyers has generally been keen. At the Liverpool sales, the wools offered were generally inferior, and those sold at a reduction in prices of from $\frac{1}{4}$ d. to $\frac{1}{2}$ d. per lb., whilst good qualities kept moderately firm. The yarn trade in the Bradford district, has been very disappointing; orders, unless placed at a reduction in prices, have been given out sparingly, and although, in sympathy with the firm tone of the sales in London, a rather better feeling pervaded the market at the close of the month, prices have not improved, and the outlook is anything but cheering for the remainder of the year. In the piece branch, a little more has been done, but at unsatisfactory rates, and in soft, plain goods, a depressive feeling has been very apparent. In the fancy dress goods and worsted coating branches, a more cheerful feeling has characterised the markets, with an improved demand, and slightly better rates.

Cotton.—The demand for the raw material has been an average one, with an improvement in prices, and a further hardening tendency was apparent at the close of the month. Yarns have had a steady demand, especially where no advance in rates has been demanded, but spinners generally have been very firm in their prices, and have refused orders, when not absolutely in want of them to keep machinery running, unless an advance has been given. At present, yarn producers are in a much better position than they have been for some time past, and as they do not generally hold much stock, they prefer to work out existing orders before entering on new engagements. Manufacturers, on the other hand, are handicapped by the state of the raw cotton and yarn branches, as they cannot procure an advance in prices for their cloth commensurate with the higher price they have to pay for yarns. The outlook for them seems cheerless, as any orders on offer are at old rates, which they cannot accept remuneratively.

Woollen.—This branch has been, on the whole, satisfactory. The finer classes of worsteds in good designs and colourings are meeting with much favour, and the new patterns now being produced by manufacturers are likely to bring them fair orders. Makers of the lower qualities of cloths, for the ready-made clothing trade, have been moderately busy during the month, and the outlook for the future seems fairly bright. Repeat orders for overcoatings have only come in slowly, the demand being mostly for beavers and meltons, in blue and olive shades.

In the medium classes of worsteds and woollens, the demand has only been fair, but, from the new patterns now being issued by manufacturers, much is hoped, and fair orders are expected.

Linen.—With the exception of the fancy damask branch, the linen trade has improved during the month, and the outlook for next year is more cheerful than for some time past. The flax trade has also improved, and for good qualities harder rates have ruled. The jute branch has been very brisk, and prices generally have much improved. The better classes of jute are scarce at present, and this fact has a tendency to raise rates higher, and to necessitate also the using of inferior qualities. All classes are being much sought up, and speculation has been on the increase. Holders of stock have mostly refused to sell unless at a decided advance in price.

Fashions in Dress and Mantle Goods.

According to *Kuhlow's Gazette*, "the principal meed of attention is being paid to a pattern which has already made its appearance this year in individual cases. On a dead background, a pattern in satin and faille is brought out in a carefully arranged ball design, and resembles the soutaché cordings which were very fashionable some time ago. It may be expected that, for the coming spring, cord and soutaché braidings will be to the front. Crefeld and Elberfeld are well aware of this, and are endeavouring to imitate the above patterns as closely as possible. On matlassé and atlas, as well as upon worsted ground, cord and soutaché effects are woven in alike in stripes and rows. The imitations are so good, that the inexperienced eye has to look twice before they can be distinguished from sewed-on tresses. In fact, these imitations are even produced on patterned velvet. On the whole, velvet is much neglected. Here and there a few striped patterns turn up. Novel are the patterns in which a velvet stripe alternates with a gauze stripe upon which beads are sewn in arabesque designs. There is no great demand for worsted stuffs with woven-in mohair effects, although the patterns are new. Cheaper stuffs of this pattern are, however, proving attractive, and enjoy an ever-increasing sale. On account of its durability and handsomeness, matlassé still maintains its popularity." According to another authority, dinner toilettes are of the very thickest and richest silks that Lyons can produce, combined with a softer material, such as French faille, velveteen, fleur de soie or peau de soie. The silks most in favour are Louis Seize silks with very wide stripes; indeed, few of the fancy silks are to be seen without stripes. One of these consists of eight wide stripes, figured at intervals with large baskets or bouquets of flowers of the same colour as the stripe, alternated with plain four-inch stripes of the same, or of a harmonizing colour. Then, again, the material is woven in six-inch stripes of satin, divided by lines of satin knots of the same, or of a contrasting colour, alternated by three-inch stripes of varying shades or colours, around which sprays of flowers of some rich colour are twined. Pompadour broché is also amongst the fashionable silks; this is a thick black faille, with fancy stripes beautifully figured with bouquets of roses, forget-me-nots, &c., and green leaves. A new silk (quadrille crepe) has a crepe-like surface, with vertical and horizontal stripes of satin, some narrow, others wide, forming a plaid. Velvets are also to be much worn, and when ornamented with the gold, silver, steel, red copper, and platina trimmings, now so very much in vogue, will form very effective toilets. Genoa velvets are very handsome; these have several narrow velvet stripes coming together, alternated by a wide stripe in satin, several inches in breadth. The narrow stripes are embroidered with silk in a lace pattern, rows of velvet balls of a darker shade than the ground separating the rows of lace insertion, whilst the wide satin stripe contains a garland of leaves and small flowers in velvet, the pile being very thick and high. Amongst the colours most affected for costumes are Madeira brown (a rich red brown), beige oak, bottle green, light and dark grey, the combination of blue and red, bois de violette, dark terra cotta, moss green, and absinthe green. For evening wear, the favourite colours are cream, etincelle, ophelie, and the various mauves, antique pink, apricot, light terra cotta, and ocean, ardine, and electric blue.



TOILET QUILT

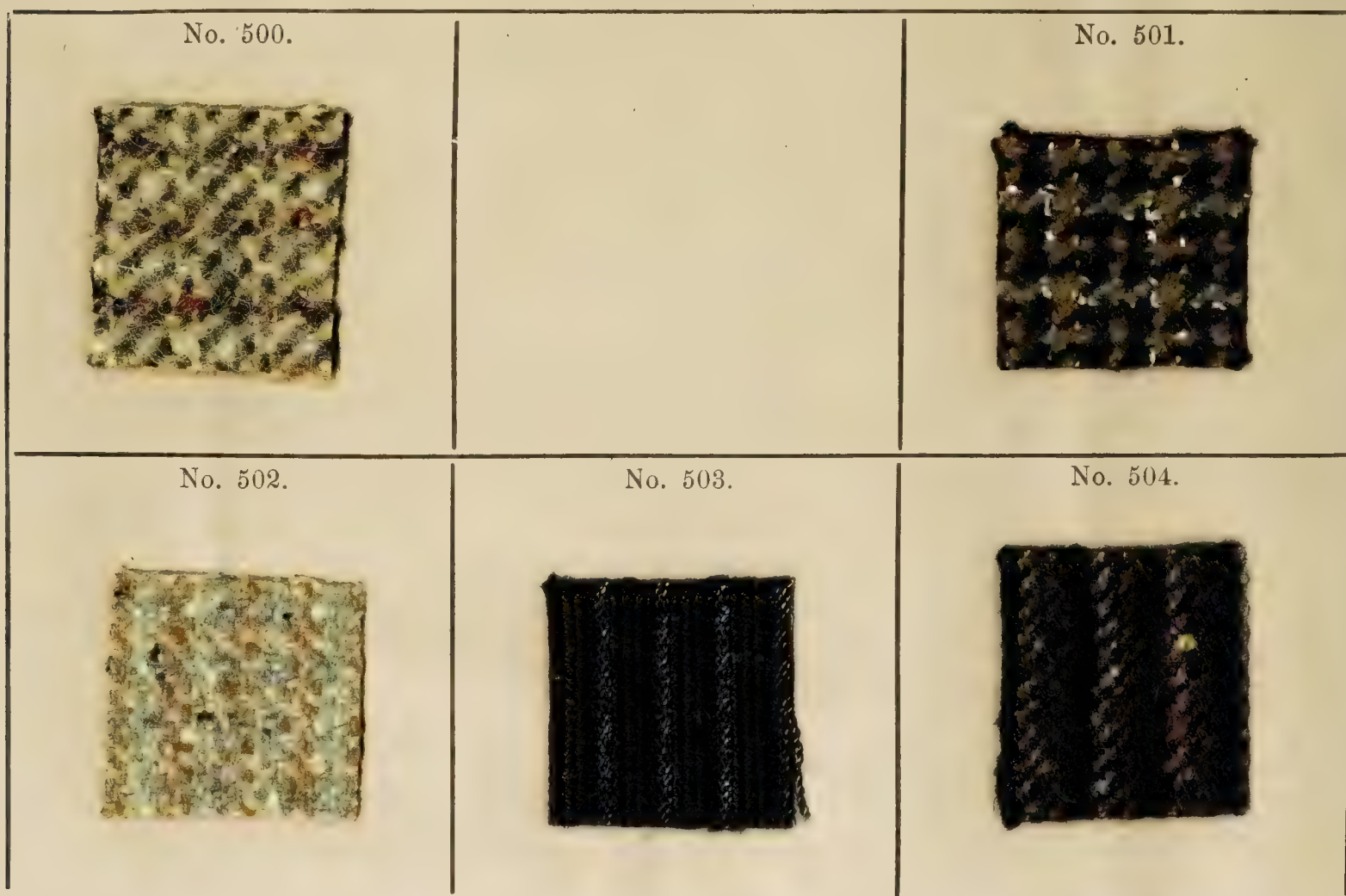




❖❖❖ SUPPLEMENT ❖❖❖
TO
The Journal of Fabrics and Textile Industries,
DECEMBER 12TH, 1887.

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The following Patterns are Woven Specimens of the Designs given on Page 67.



Suiting.

1,920 ends in warp ; 30 ends per inch ; 30 picks per inch ; 10's slay ; 3 ends in a reed ; 64 inches wide in the loom ; 56 inches wide when finished. Cheviot finish, soft and bulky. Weight 20 ozs. Straight Draft

Warp :—

2 ends Black 1/12's, twisted to White 1/12's woollen, with 2/48's
Crimson worsted overtwist.

4 „ Drab 1/12's woollen.
2 „ White 1/12's woollen, twisted to 2/48's White worsted.
4 „ Drab 1/12's woollen.
2 „ Brown 1/24's woollen, twisted to White 1/24's woollen.
4 „ Drab 1/12's woollen.
2 „ White 1/12's woollen, twisted to 2/48's White worsted.
4 „ Drab 1/12's woollen.

3 picks Black $1/12$'s woollen.
2 ,, Black, White and Crimson twist as warp.
3 ,, Black $1/12$'s woollen.
1 pick White as warp.
2 picks Black $1/12$'s woollen.
1 pick White as warp.
3 picks Black $1/12$'s woollen.
2 ,, Black $1/24$'s woollen, twisted to White $1/24$'s.
3 ,, Black $1/12$'s woollen.
1 pick White as warp.
2 picks Black $1/12$'s woollen.
1 pick White as warp.

Suiting or Mantle Cloth.

2,304 ends in warp.
 36 „ per inch.
 36 picks „
 12's reed.
 3 ends in a reed.
 64 inches wide in the loom.
 56 „ when finished.

Straight Draft.

Warp :—

1 end Black $1/24$'s, twisted to White silk waste, $1/24$ woollen.
4 ends Smoke $2/24$'s.
1 end Black $1/24$'s, " " " "
4 ends Black $2/24$'s.
1 end Crimson $2/24$'s.
2 ends Smoke $2/24$'s.
5 " Black, $2/24$'s.

Woven:—

1 pick Black and White silk as warp.
4 picks Olive 2/24's woollen.
1 pick Black and White silk as warp.
4 picks Black 2/24's woollen.
1 pick Smoke 1/24's woollen, twisted to Crimson 1/24's.
2 picks Olive 2/24's woollen.
5 „ Black 2/24's woollen.
Finish clear and soft. Weight 24 ozs. to the yard.

Mantle Cloth.

Warp :—

4 ends Grey Mixture, 12 skeins woollen.
4 „ Drab „ „ „

Woven :—

4	picks	Olive Mixture,	12	skeins	woollen.
1	pick	Grey	"	"	"
1	"	Pea Green Mixture,	12	skeins	woollen.
1	"	Grey	"	"	"
1	"	Pea Green	"	"	"

1,612 ends in warp ; 26 ends per inch ; 26 picks per inch ; 13's slay ; 2 ends in a reed ; 62 inches wide in the loom ; 56 inches wide when finished. Clear finish. Straight Draft. Weight 18 ozs.

Trouserings.

No. 503

Design.

Pegged to fall.

Finish clear and smart

Weight 20 ozs.

Warp :—12 ends Black angola, 18 skeins.

1	end	Black worsted 2/48's	} Twice.
1	„	Black angola, 18 skeins	
1	„	Black worsted 2/48's	
1	„	Black worsted 2/48's, twisted to Blue silk.	
1	„	Black angola, 18 skeins.	
1	„	Black worsted 2/48's, twisted to Blue silk.	
1	„	Black worsted 2/48's, twisted to White silk.	
1	„	Black angola, 18 skeins.	
1	„	Black worsted 2/48's, twisted to White silk.	

Woven :—1 pick Black worsted 2/48's.

1,, Black worsted 2/36's.

4,928 ends in warp ; 77 ends per inch ; 76 picks per inch ; 16's slay ; 4, 4, 4, 6, 6 ends in reeds ; 64 inches wide in the loom ; 56 inches wide when finished.

No. 504.

1,024 ends.

Plan.

32 „ per inch.
32 picks „
8's slay.
4 ends in a reed
32 inches wide in
28 „ „ wh

Warp :—

4 ends Black $2/30$'s woollen.
1 end Black $1/40$'s, twisted to Olive $1/40$'s, and overtwisted with Black $1/40$'s.
1 „ Black, $1/40$'s, twisted to Olive $1/40$'s, and overtwisted with Maroon $1/40$'s.
1 „ Brown Olive $2/30$'s.
1 „ Black $1/30$'s, twisted to Orange $1/30$'s.
1 „ Brown $1/40$'s, twisted to Canary $1/40$'s, and overtwisted with Brown $1/40$'s.
1 „ Crimson $1/40$'s, twisted to Lavender $1/40$'s, and overtwisted with Lavender $1/40$'s.
1 „ Olive $1/40$'s, twisted to Lavender $1/40$'s, and overtwisted with Lavender, $1/40$'s.
1 „ Steel $2/30$'s.

Woven:—All Black weft, 10 skeins woollen.

Straight Draft. Weight 11 ozs. to the yard. Soft finish.

Commercial Failures.

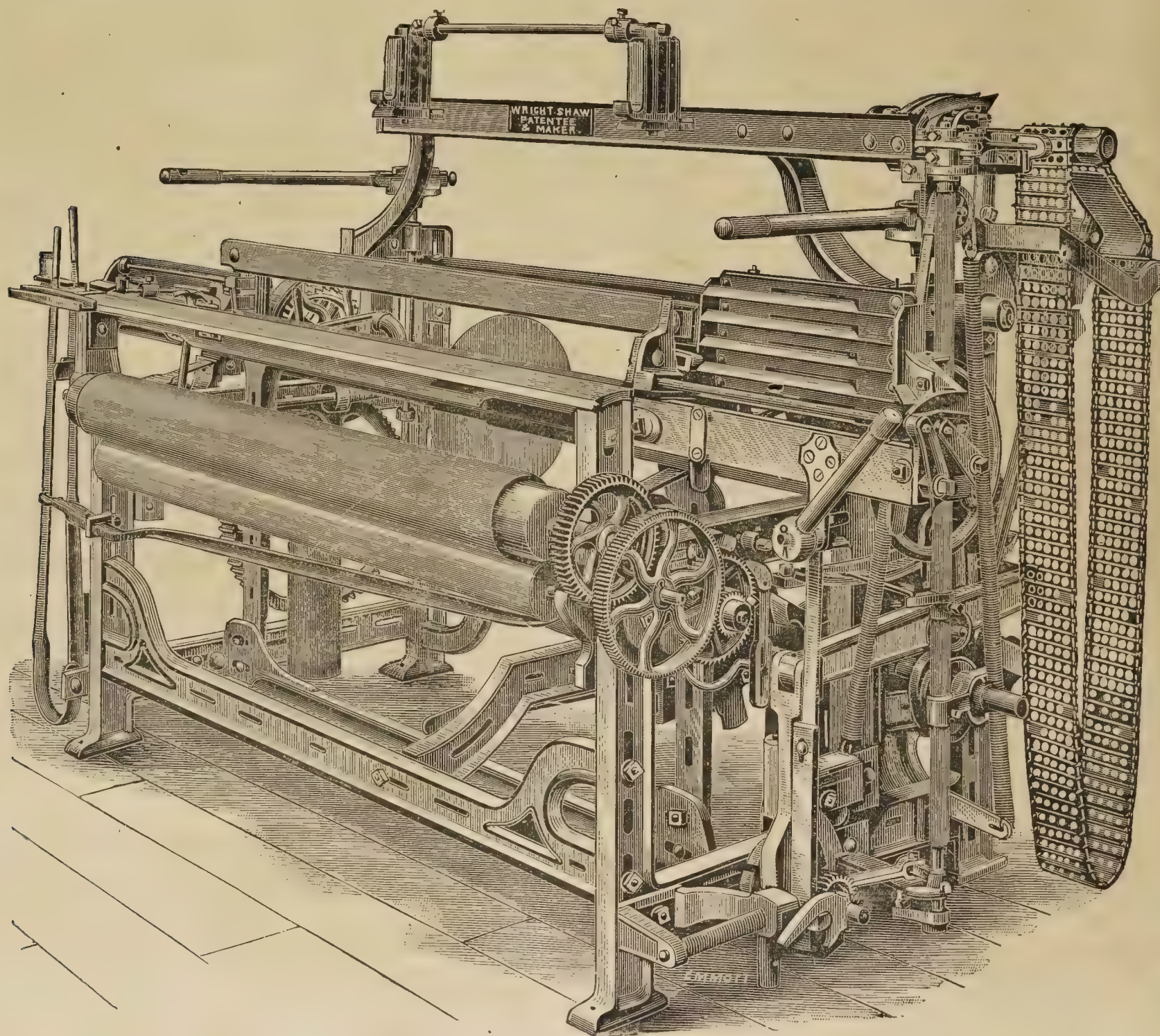
According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the four weeks ending Saturday, November 26th, was 401. The number in the corresponding four weeks of last year was 420, showing a decrease of 19, being a net decrease in 1887, to date, of 37. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, November 26th, was 1,022. The number in the corresponding four weeks of last year was 1,089, showing a decrease of 67, being a net increase, in 1887, to date, of 205. The number published in Ireland for the same four weeks was 51. The number in the corresponding four weeks of last year was 62, showing a decrease of 11, being a net decrease, in 1887, to date, of 225.



MACHINERY, &C.

Improved Drop-box Loom for Weaving Scarfs, Handkerchiefs, and Checks.

At the recent Exhibition at Manchester, a loom, specially adapted for the weaving of scarfs, handkerchiefs, checks, and such like goods, was exhibited by Mr. Wright Shaw, of Bank Foundry, Bredbury, near Stockport. The mechanism, in which there are many improvements of great importance, was inspected by large numbers of those interested in the above branches of the textile trade, and the opinions formed were that,



barrels and one pair of wheels, and 16 pegs in place of 32, as formerly used by Mr. Shaw; this is a distinct saving. The pattern chain is not drawn up and worked tight, no springs being required to keep it tight; it hangs over the eight square barrel by its own weight only, avoiding unnecessary friction, and slack or tight pattern chain is reduced to a minimum. It is calculated that a saving of at least $\frac{2}{5}$ is effected in the cost of pattern chains. The eight square barrel is fixed at such a height that the weaver can see when anything goes wrong without leaving the alley. The chain economiser is very sensitive, so that, when a weft thread breaks, its movement is immediately stopped. Each pattern chain will weave six different patterns without removal from the loom, each link or card of this chain giving 2, 4, 6, 8, 12, or 24 picks as required. The shuttle boxes are well balanced by means of two long steel wire springs, coupled by a strap working over a pulley, and it is guaranteed that a five-shuttle box is as well balanced in this loom as a two-shuttle box in those made formerly by this firm. The loom can be run from 170 to 180 picks per minute. It will be readily conceded by users of this class of loom that, in its improved mechanism, there are points of a very advantageous nature, and such as ought to interest manufacturers of the classes of goods before mentioned. It can be seen working at Mr. Shaw's premises at Bredbury, where full particulars and prices will be given upon application.

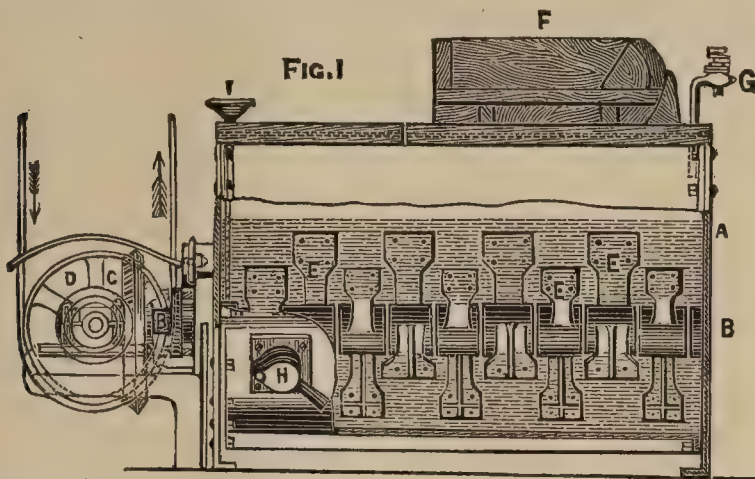
generally, the loom was a distinct advance upon any in the market, and that it was eminently adapted to the perfect weaving of fabrics of the character for which it had been made. Mr. Wright Shaw has, for years, been a prominent maker of drop-box looms, and he claims many advantages for this loom over others. During the Exhibition, we had many opportunities of seeing it in actual work upon different kinds of goods, and of judging of its various capabilities. The mechanical parts went through their operations with a precision calculated to turn out goods having very few imperfections after being woven. The general construction of the apparatus can be gleaned from the accompanying illustration. The loom will have ample room for working in 10 feet bays; this is a consideration with manufacturers. Our space forbids a detailed description of the improvements it contains, but we may state that the primary object has been simplifying the parts of the drop-box motion, and bringing them under the hand of the weaver, thus obviating many grievances that looms often entail upon weavers; at the same time, the production is increased, and better work is turned out. In weaving, only one eight square pattern chain barrel is required to perform all the necessary work of three chain

A New Boiler Furnace.

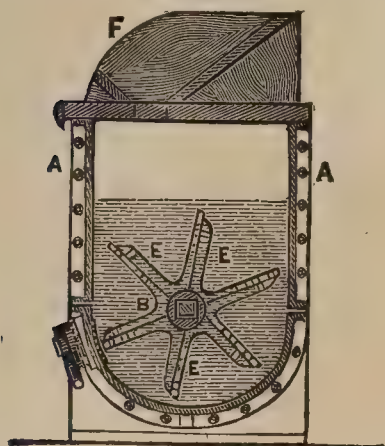
An Austrian engineer, Herr Mondini, residing at Genoa, has introduced an improvement in boiler furnaces, which is stated to effect a more thorough utilisation of the fuel. Mondini's so-called "double grate," which is said to ensure the greatest possible heat with complete combustion of the fuel, by preventing the formation of smoke and cinders, consists of a series of plates from two to four millimetres thick, which divide the front part of the grate into several sections. The air entering through the opening of the grate supplies and maintains combustion in the front part of the furnace, whilst the air entering from beneath the plates through the ashpit is utilised entirely in the combustion of the fuel lying in the posterior portion of the firebox. The practical result of this arrangement, which, it is stated, may be easily and economically introduced in all boiler furnaces, including those of the marine type, is said to be a saving of 10 per cent. with good coal, and of from 20 to 25 per cent. with slack or any other small fuel. The invention has been introduced at one of the largest ironfoundries of Liguria, that of Cavero and Co.—*Iron*.

Fenton's Machine for Mixing Fuller's Earth.

The tendency to replace heavy manual labour by machine work becomes more apparent as time passes on, and the various branches of the textile trades form no exception to the rule. An invention, recently patented by Mr. S. Fenton, of the firm of Messrs. J. Fenton and Sons, Batley Carr, near Dewsbury, will be welcomed by a large section of manufacturers of textile goods, as it will undoubtedly effect a considerable economy in one department in the production of certain classes of fabrics. Fuller's earth, which is used principally for woollen goods, is generally mixed by hand labour, and this work is by no means of the lightest kind. The earth is put into a vessel of water, and well stirred in order to bring it to the proper consistency for spreading upon the goods. The mixture, unless constantly stirred, becomes



plastic, and certain portions have a tendency to sink to the bottom of the vessel; there are also foreign substances in the earth, such as pebbles, stones, &c., which must be strained from the mixture, or they are put upon the fabric, injuring it more or less. By the use of this machine, all the above disadvantages are entirely obviated, the mixture coming from the apparatus of a uniform consistency, without any hard or plastic substances in it. Fig. 1



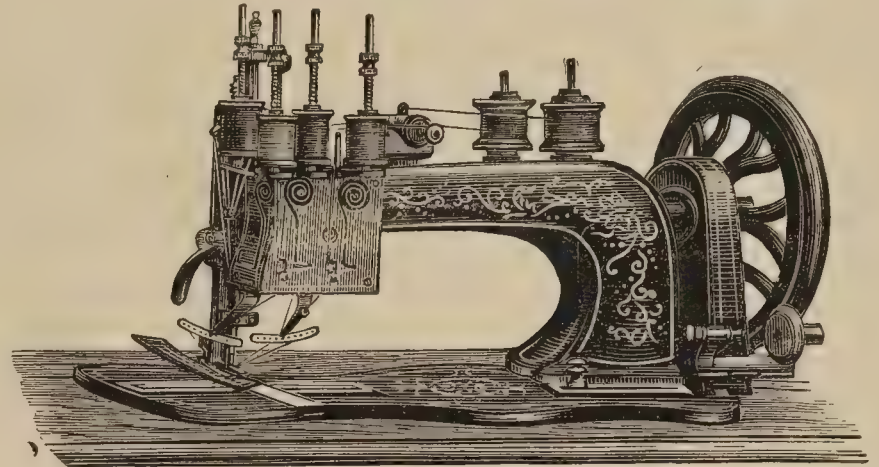
will give a good idea of the general arrangement of the machine. It consists of a cistern or tank A, the top of which is covered in. It is provided with a hopper F, through which the substance to be mixed is introduced. Water is run into the cistern at G; a horizontal shaft BB runs through the tank, and upon this are fixed a required number of wings, or vanes, E. The shaft is driven by bevel wheels C, and by driving pulleys D. When in motion, the wings, or vanes, E keep the liquid in a constant state of agitation, thus the mixture is always ready for use, and, when required, a valve H is opened, and the mixed substance is allowed to run into a pail or other suitable vessel. To prevent any unmixed material escaping through the valve H, it is provided, on its inner side, with a screen of wire gauze, which effectually counteracts any unevenness in the liquid, and ensures regularity when spread upon fabrics. The apparatus requires very little attention, the Fuller's earth being simply placed in the hopper F, from whence it immediately falls into the cistern, and the mixing operation then proceeds. We have seen the machine at work, and can speak highly of its advantages. It will, undoubtedly, save its cost to any manufacturer in a very short time. We may add that the apparatus can be utilised for the mixing of other substances as well as Fuller's earth. Mr. J. Fenton will be pleased to show the machine working, or will give full particulars of it on application.

An Invention for Ornamental Sewing.

"THE UTILITY EMBROIDERER."

We have recently had our attention directed to an invention which, we consider, marks one of the greatest advances in connection with sewing mechanism which have been introduced for many years past. The machine is intended for ornamental sewing, is entirely new in principle, and accomplishes, in the most rapid manner, an innumerable variety of ornamental stitches, some of which have been sent us for inspection, and we are informed that these patterns were produced, by an ordinary worker, as fast as the machine could be operated. The invention is the result of the labours of an Englishman who has for years been devoting his spare time to working out automatic devices for saving labour, and the present example certainly does him great credit. The work done on this machine has much the appearance of braid on the face of the fabric, the braid being made by the machine, and sewn on as it is made at one operation, in as simple a manner as the working of an ordinary sewing machine, and now that there is quite a rage for braided garments, braiding being worn on dresses, jackets, hats, bonnets, &c., the mechanism is the right thing at the right time. The principle employed can be applied to almost any system of sewing machine, and opens up a new and extensive field for manufacturers in a great number of trades, enabling them to produce a class of ornamental work hitherto impossible. As the ornamental stitching can now be made of any desired width as easily and quickly, and, excepting cost of material, as cheaply as plain sewing, it appears to us that this machine is likely to cause quite a revolution in many trades, such as corsets, slippers, hosiery, gloves, ladies and children's clothing, frilling, mantles, art needlework, tailoring, &c. One great

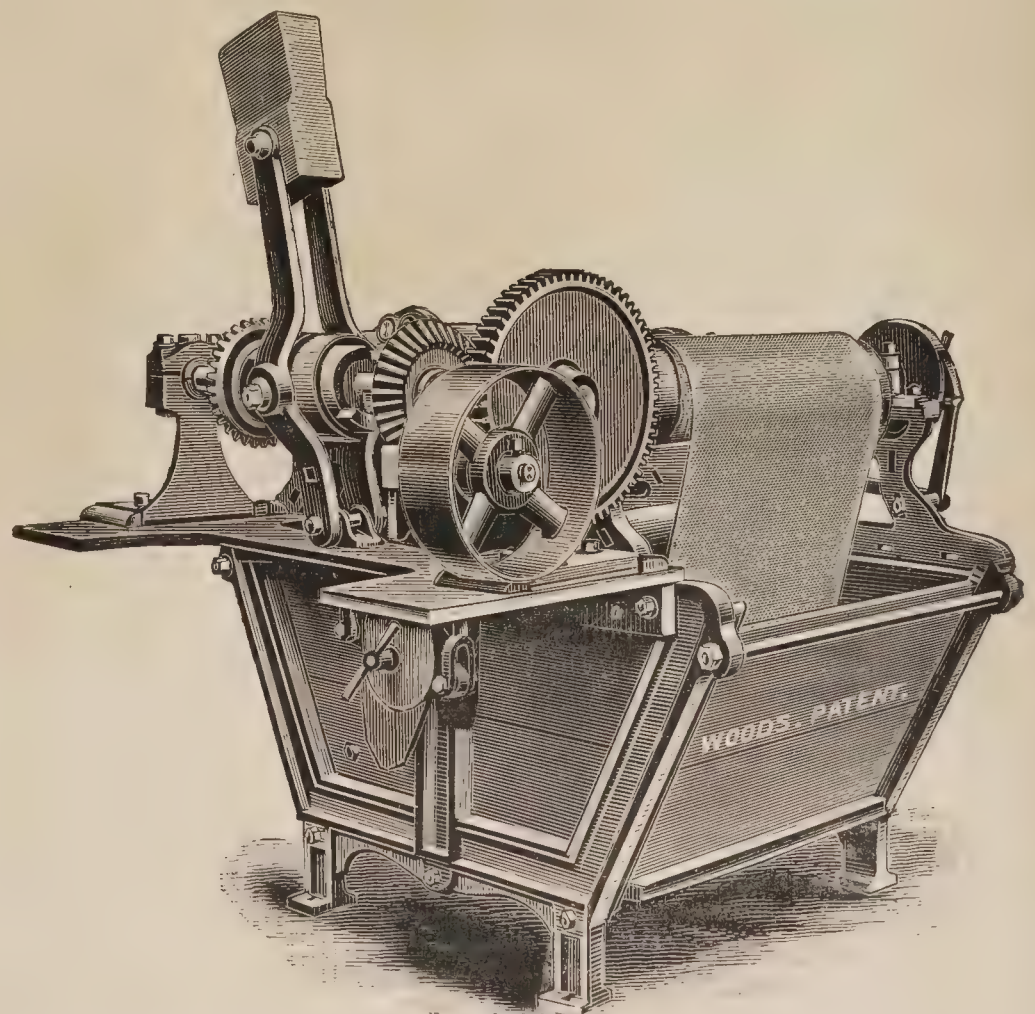
merit of this invention is its extreme simplicity, and the ease and rapidity with which the various patterns can be made and changed. The "Utility Embroiderer," as will be seen from the woodcut, is an ordinary sewing machine, to which is attached a small box or case about three inches square, having reels of silk, cotton, worsted, or chenille on the top. Below are two guides which are close to the needles, and vibrate in front of them. The embroidering threads are passed through eyes down to the guides, and the guides being actuated by cams (contained in the case we have mentioned, and which cams are driven from the needle bar) these threads are carried backwards and forwards in front of the needles, and are sewn down on the cloth or material while the seam is being made. By an ingenious arrangement, the guides can be made to pass to and fro in front of the needle in any order or time that may be desired, crossing the needle either at every stitch, or at every other stitch, or taking one and missing two, or taking two and missing one, or in any other order that may be desired. The machine can either have one or two needles, but if the latter, a great variety



of patterns is obtained. In the former case, at least fifty different designs can be worked, and the number with two needles is almost without limit. We are informed that the principle of the machine is such that a thousand different designs can be produced, and as many as twenty different threads may be used for one pattern. These designs are varied by merely altering the threading and timing of the machine, the operation being simplicity itself. Thus an ordinary machine operator could produce any desired pattern with such simple instructions as are sent out with the machine, and there is no reason whatever why the invention should not be utilised by any one who can use a sewing machine. All who have seen this mechanism in operation concur in the opinion that the invention will produce a class of work that has been impossible, and its usefulness is likely to become so great that it may be placed in the fore-front of machine inventions. The proprietors have show-rooms at No. 2, Long Lane, London, E.C., where they will have pleasure in showing the machines at work to any interested persons.

Wood's Patent Burl-Dyeing Machine.

In the burl-dyeing machines now in general use, there are many drawbacks, the chief of which are the continuous attention that is required from



the dyers, and the unequal tension put upon the piece of cloth being manipulated, unless it is continually watched when the fabric is undergoing this process. Dyers often know to their cost what these disadvantages entail,

and numerous expedients have been devised to obviate such grievances. Messrs. E. and J. Wood, of Hunslet, Leeds, have recently patented an improvement in one of these machines, which ought to be taken advantage of by all those interested in the special branch of dyeing to which this apparatus is adapted. The machine illustrated will, when the cloth is put on the rollers and set in motion, run any length of time without further attention. The old hand reversing and hand breaking apparatus is dispensed with, and, instead, an automatic arrangement is used, which, being once set, acts in such a manner that the tension upon the fabric is the same from the commencement to the completion of the operation, and, in consequence, the liability to damage is reduced to a minimum. The fabric, in moving from one roller to the other, is dipped twice in the liquor, and is partially squeezed between the two dippings. The operation of dyeing the fabric is performed in less time than is usually required, and is conducted in a much more satisfactory manner than by the old method. The machine is simple in construction, there being no complicated parts in the apparatus. Manual labour is considerably reduced by its use, as, after the machine is set in motion, with the proper brake power applied, the attendant can go on with other work until the piece being dyed requires removal. We have had an opportunity of seeing the machine, and can speak highly of its utility. The above-named firm, or Mr. T. C. Fawcett, Manor Road Foundry, Leeds, who is sole maker, will give further particulars and prices on application.

A New Colour Measurer.

Mr. J. W. Lovibond, of Salisbury, attended a meeting of the Society of Dyers and Colourists, held under the presidency of Professor Hummel, Yorkshire College, Leeds, in the Science Lecture Hall of the Bradford Technical College, for the purpose of giving a description of a new instrument, devised by him, for comparing and matching colours. The inventor has named it a "Tintometer." The instrument has been on view at the Manchester Exhibition, and several members of the above society have had it under private examination for some time. Mr. Lovibond explained that his instrument consisted of a square tube with an eye-piece at one end, divided internally by a partition which, at the eye-piece, presented a knife edge, and widened at the other end to half-inch section. A number of grooves in each division enabled tinted glasses to be introduced in either division at pleasure. At the open end of the tube was a shallow box without top, and coloured dead white inside. When it was desired to compare two coloured materials, a piece of each stuff was fixed against the side of the box opposite the end of the tube divisions, and by placing one or more slips of delicately graded and pure coloured glass in the grooves of the division, above the lighter coloured cloth, until viewed through the eye-piece, both colours matched, the exact difference in tint was speedily obtained. When it was desired to obtain the colour value of a piece of cloth, the sample was fixed opposite to one division of the tintometer, and coloured glasses placed in the other until the tints agreed when viewed through the eye piece. Slight adaptations of the instrument fitted it for the testing of the colour value of liquid dyes. A number of "tintometres," both for liquid and solid colour measurement, were exhibited, together with several cases of the glass slips used. The lecturer explained that, for each colour, he had prepared a series of slips graduated from the faintest tint up to practical loss of colour in absolute blackness. Each slip bore the number of its series, and of its colour, and as their values were always the same, the instrument gave an absolutely invariable standard of colour measurement. A long discussion followed upon the reading of the paper, in the course of which, Professor Hummel suggested that, in place of the arbitrary colour standard adopted by Mr. Lovibond, the example of Chevreuil in taking the colours of the spectrum as the initial standard should be followed, these colours forming absolutely fixed and invariable points of departure. Several gentlemen joined in the discussion, the general consensus of opinion being that, although the instrument was not yet perfectly adapted for colour testing, it was a most important step towards the solution of a difficulty which has long been experienced by dyers and colour matchers. A vote of thanks to Mr. Lovibond closed the meeting.

Steady progress is being made in the arrangements for the forthcoming Italian Exhibition to be held in London. It is stated that the Queen of Italy will herself perform the opening ceremony. The Italian Prime Minister, as well as many others in the highest quarters, take an active interest in the movement. The general committee, of which Sir Frederick Leighton is honorary president, has been joined by Sir J. Millais and Mr. Ruskin.

False Trade Marks.

The *Gazette* announces important regulations made on the 1st instant by the Commissioners of Customs, under Section 16 of the Merchandise Marks Act, 1887, which provides that all goods of foreign manufacture, bearing any name or trade mark, being, or purporting to be, the name or trade mark of any manufacturer, dealer, or trader in the United Kingdom, unless such name or mark be accompanied by definite indication of the country in which such goods were made or produced, shall be prohibited to be imported. By Section 18 of the same Act, it is enacted that where the trade description includes the name of a place or country calculated to mislead as to where the goods were actually made or produced, such goods not having been actually made or produced there, the goods so marked would be prohibited, unless there be added to the trade description, immediately before, or after, the name of the place or country, in an equally conspicuous manner with that name, the name of the place or country in which the goods were actually made or produced. The Commissioners of Customs have therefore made the following regulations:—Goods having applied to them forged trade marks, false trade descriptions, or marks, names, or descriptions otherwise illegal, which upon examination are detected by the officers of Customs, are to be detained by them without the requirement of previous information. In giving information with a view to detention, an informant must give to the collector or superintendent, or the chief officer of Customs of the port (or sub-port) of expected importation, notice in writing, stating the number of packages expected, as far as he is able to state the same; the description of the goods by marks or other particulars sufficient for their identification; the name or other sufficient indication of the importing ship; the manner in which the goods infringe the Act; the expected day of the arrival of the ship; and he must deposit a sum sufficient to cover any expense which may be incurred in the examination. If, upon examination, the officer of Customs be satisfied that there is no ground for their detention, they will be delivered. If he be not so satisfied, he will decide either to detain the goods, or to require security from the informant for reimbursing the Commissioners all expenses and damages incurred in respect of the detention. The security thus required must be an immediate *ad valorem* deposit of £10 per cent. on the value of the goods, and, also, subsequently a bond to be completed within four days in double the value of the goods, with two approved sureties, when the *ad valorem* deposit will be returned. If the security is not duly given as above required, there will be no further detention of the goods. The security will be given up if the forfeiture is completed, if the goods are released by the Commissioners, and no action or suit has been commenced against them. The above regulations apply to transshipment and transit goods, as well as to goods landed to be warehoused or for home consumption. January 1st, 1888, is fixed as the day from which they will take effect.

Metallic Lustre in Prints.

Substances giving this lustre are either printed upon the goods, or deposited by operation analogous to dyeing. The bronze powders are most largely employed. These powders are obtained:—(1) in a mechanical way by files, or by breaking leaves of the metal in mortars; or (2) by chemical means, where the metals composing the powders, *viz.*:—copper, zinc, tin, and antimony, are deposited from solutions of their salts. Bronze powders of all colours are produced:—white, yellow, gold, copper-coloured, red, orange, green, and blue. The shades are obtained by a species of annealing; the bronze powders are heated with fats, paraffine, or oils, with constant stirring. The blue bronze is made of a mixture of tin, antimony, and copper; it is broken up and acted upon by sulphuretted hydrogen for twelve hours, and then heated to 350° F. Mica powder in fine scales is also employed. *Application of the bronzes.*—A drying oil, or rubber solution, can be printed on the cloth, and the powder sifted on. When the goods are partly dry, the particles, which are not fastened, are brushed off; or resin can be sprinkled on, and then the bronze powder, and the goods should be passed over a hot iron plate. The resin melts and fastens the bronze. Goods can

thus be gilded or silvered with gold or silver powders. Gold and silver leaf can be similarly placed on goods either by oil or by resin. Wohlfarth's method is also used. This consists in mixing the bronze with two parts of silicate of soda or potash solution. This is printed and allowed to dry, and glycerine or sugar added to retard the drying. This printing is fast to water, light, heat, and weather. Rosenstheil's method consists in printing a salt of antimony, lead, or silver, and then, by exposure to sulphuretted hydrogen, he obtains a sulphide of metallic appearance. This is an excellent method. Agnelet fastens the bronzes with transparent varnish. A powder known as *argentine* is much used for silvering. It consists of metallic tin precipitated from the chloride of tin by zinc in fine crystals. It is best printed with caseine and ammonia, dried, and calendered.—*Le Teinturier Pratique*.

Deeds of Arrangement Act, 1887.

The Act bearing the above title comes into force on the 1st of January, 1888, in England and Wales and Ireland—Scotland being exempt from its operation. Its application to deeds between debtors and creditors is shown by clauses 4 and 5, which are that:—

4.—(1) This Act shall apply to every deed of arrangement, as defined in this section, made after the commencement of this Act. (2.) A deed of arrangement to which this Act applies shall include any of the following instruments, whether under seal or not, made by, for, or in respect of, the affairs of a debtor for the benefit of his creditors generally, (otherwise than in pursuance of the law, for the time being in force relating to bankruptcy), that is to say:—(a.) An assignment of property; (b.) A deed of, or agreement for, a composition; and in cases where creditors of a debtor obtain any control over his property or business; (c.) A deed of inspectorship entered into for the purpose of carrying on, or winding up, a business; (d.) A letter of license authorising the debtor, or any other person, to manage, carry on, realise, or dispose of, a business, with a view to the payment of debts; and (e.) Any agreement or instrument entered into for the purpose of carrying on, or winding up, the debtor's business, or authorising the debtor or any other person to manage, carry on, realise, or dispose of, the debtor's business, with a view to the payment of his debts. 5.—From, and after, the commencement of this Act, a deed of arrangement to which this Act applies shall be void unless the same shall have been registered under this Act within seven clear days after the first execution thereof by the debtor, or any creditor, or, if it is executed in any place out of England or Ireland respectively, then within seven clear days after the time at which it would, in the ordinary course of post, arrive in England or Ireland respectively, if posted within one week after the execution thereof, and unless the same shall bear such ordinary and *ad valorem* stamp as is under this Act provided.

Complete copies of the Act may be obtained of the Government printers at a cost of a penny.

A New Waterproofing Process to be Tried.

A correspondent in Berlin states that the following process is being employed with considerable success in one of the large waterproofing establishments in Germany. Woollen and half woollen cloths are treated with a solution of 100 parts of alum, 100 parts of glue, five parts of tannin, and two parts of soluble glass. The alum is dissolved in a moderate quantity of boiling water, the glue is steeped in cold water until it has absorbed twice its weight of water, and is then melted by heat. The tannin and soluble glass are well stirred into the solution of glue, to which the alum solution is then added, and the whole is well stirred and allowed to cool. The gelatinous mass is employed as follows:—One kilo. of the mass is boiled for three hours in 10 to 15 litres of water, fresh water being continually added to compensate for evaporation. The bath is then allowed to cool to 80 degrees Centigrade, and the material to be rendered waterproof is kept in it for half an hour, then withdrawn, and the moisture is allowed to drip from it for several hours. Finally the cloth is stretched on a frame and allowed to dry at a temperature of 50 degrees. The cloth gains considerably in weight, and is perfectly waterproof, though it impedes neither air nor perspiration. Of course, the cloth is eventually calendered. The dyes of coloured cloths are rendered more permanent by this process; but when light colours are in question, it is requisite to use as colourless glue as possible, and alum that is entirely free from iron.



ODDS AND ENDS.

The new French incombustible lace is quite a novelty, and the composition by which the result is achieved is equally adapted, it seems, to rendering wool and paper unflammable. It is a mixture of 80 parts pure sulphate of ammonia, 25 parts carbonate of ammonia, 30 parts boracic acid, 17 parts pure borax, 20 parts starch, and 1,000 parts distilled or pure water. These ingredients are most thoroughly combined; the materials are dipped in this solution while hot, so as to be completely impregnated, after which they are dried and ironed as ordinary starch fabrics.

Russia is apparently determined to raise the native production of wool. The new Russian tariff imposes a heavy tax on cotton and woollen yarns, flax, hemp, jute, textile fabrics and lace. Although the importation of raw cotton in 1886 shows a decrease, the import duty paid on this article in that year amounted to 3,261,000 roubles. It is even stated that a Liverpool company has made arrangements with some capitalists in the Caucasus with a view to erecting vast wool-scouring establishments in that country.

A new source of wealth has been opened up for Russia by the discovery of vast deposits of asbestos in the Dural district. It appears that in the neighbourhood of the Verkin Tagil iron mines, between Orenburg and Ekaterimburg, there exists a hill called Sholkovoga Gora, or the hill of silk, which consists entirely of asbestos. The mineral is said to be of the best quality, and applicable to all the various uses for which asbestos is employed at the present time. Again, in the Perm district, similar deposits have been found on the surface, so that the mineral can be obtained with trifling expense.

The *Standard* Paris correspondent says:—The Minister of Commerce requests me to inform all English manufacturers, artists, or agriculturists who may be desirous of taking part in the Exhibition of 1889, that, pending the appointment of a British Commission, they can forward applications for admission and space to the French Consulate General, 38, Finsbury Circus, E.C., and also to the French Consuls at Liverpool, Glasgow, Dublin, Newcastle, and Cardiff. These applications will be transmitted to the head office in Paris, where they will be classified until the formation of the British Commission.

The Oxford and Cambridge Board for the examination of Schools, is entering upon a new departure. It will henceforth hold an annual examination for a Commercial Certificate, which will be an excellent test for the instruction given in what claims to be the modern or commercial side of our larger schools. The Certificate will only be granted to those who pass in mathematics, English, geography, one modern language (including conversation), and another subject selected from a group. The scheme, which is published by the Board, has been drawn up after consultation with Sir B. Samuelson, Sir H. E. Roscoe, and Mr. Mundella, and suggestions have also been received from some of the chief Chambers of Commerce, which almost unanimously approve of the proposed examination to be held in July, 1888. Some of the most important Grammar and other schools in the country have already notified their willingness to rearrange the school, so as to provide for higher commercial education, and to enable pupils to gain the "Commercial Certificate."

The *Italian Bollettino di Notizie Commerciali* states that "the first German manufactory of ramie was established in Yattau. The thread produced has the brilliancy of silk and is used largely for the upholstering of furniture. After some initial delay and disappointment, the manufacture began to flourish, and since 1883 has been in a very satisfactory condition. The cultivation of the ramie is carried on in the Oberkunewalde with the following species of plants, the *Urtica dioica*, or common nettle of Germany, the *Laportia Canadensis*, or North American nettle, the *Urtica nivca*, or China grass, a native of China, and the *Urtica tenacissima*, or ramie proper, which was originally discovered in Siberia, then cultivated in Algeria and afterwards introduced into central France, and lately into Hungary. The two last named species have borne the winter in Oberkunewalde with perfect success."



PATENTS.

Applications for Letters Patent.

Automatic apparatus applicable to knitting machines. W. H. Hoyle, London.	24th Nov. 15,171
Brakes of looms. J. Bullough and J. Kirkham, Halifax.	16th Nov. 15,684
Cotton bands and ropes. W. Haigh, Halifax.	31st Oct. 14,796
Cutting off steam from slashing machines. J. Taylor, Blackburn.	2nd Nov. 14,922
Carding engines. T. S. Whitworth, Manchester.	2nd Nov. 14,967
Carding engines. E. Gaunt and W. Forth, Bradford.	3rd Nov. 14,975
Combing machines. B. Berry, Bradford.	5th Nov. 15,080
Cutting and raising the pile or nap of fabrics. J. Newhouse and J. Sampson, Manchester.	12th Nov. 15,473
Carpets and rugs. J. Brinton and Co., and J. H. Pearse, London.	12th Nov. 15,487
Checking shuttles in looms. J. Heap, J. Hoyle and F. Crosland, Halifax.	14th Nov. 15,533
Card cylinders for jacquards. J. E. Wadsworth, Manchester.	16th Nov. 15,700
Combing fibres. H. W. and J. H. Whitehead, London.	18th Nov. 15,809
Combing machines. B. A. Dobson and J. Hill, Manchester.	19th Nov. 15,894
Cloth raising. J. Schofield, Manchester.	19th Nov. 15,934
Cleaning yarn and thread. L. Haslam and C. Marshall, London.	19th Nov. 15,937
Carding engines. G. and E. Ashworth, Manchester.	22nd Nov. 16,012
Connecting the picker with the picking stick in looms. J. T. Butterworth, Rochdale.	22nd Nov. 16,021
Carding engines (improvements in) for ensuring division of slivers or threads of fibrous materials. G. Eastwood, Rochdale.	22nd Nov. 16,024
Carding engines. G. and C. E. Kilner, Huddersfield.	24th Nov. 16,140
Controlling the grinding of carding engine flats. J. M. Hetherington, Manchester.	24th Nov. 16,157
Cylinder printing machines for calico and other web fabrics. J. Blair, Glasgow.	24th Nov. 16,179
Drawing rollers of spinning machinery. R. Taylor, Manchester.	28th Oct. 14,666
Doubling and winding yarn. J. Horrocks, London.	31st Oct. 14,801
Dyeing "tops" and fabrics. J. Lodge, Huddersfield.	4th Nov. 15,022
Drawing and preparing machines. T. Farrington and E. Fletcher, London.	10th Nov. 15,371
Driving pulleys and driving belts. J. A. Leeming, Halifax.	11th Nov. 15,403
Dyeing. J. Grunhut, London.	11th Nov. 15,432
Dobbies of looms. J. Southworth and F. W. Jepson, Halifax.	12th Nov. 15,466
Dyeing and printing cotton velvet in two colours, producing a shot effect. J. Marshall, Walsden.	21st Nov. 15,972
Decorticating fibres. A. M. Clark, London.	22nd Nov. 16,078
Drop box looms. C. Hahlo, C. E. Liebreich, and T. Hanson, Halifax.	23rd Nov. 16,094
Driving machinery without labour, gas, steam, or electricity. D. Jones and C. E. Quilter, London.	25th Nov. 16,232
Dobbies. C. T. Bradbury, W. Halliday, and H. Livesey, Bradford.	28th Nov. 16,307
Flock making machines. J. Illingworth, Halifax.	3rd Nov. 14,970
Fulling, scouring, &c., machines. W. A. L. Hammersley, London.	5th Nov. 15,097
Feed rollers of carding engines. G. Eastwood, Rochdale.	19th Nov. 15,892
"Fuel economisers." A. Lowcock and T. Sykes, Manchester.	23rd Nov. 16,114
Gas motor engines. H. Williams, Manchester.	25th Nov. 16,198
Gas motor engines combined with pneumatic or hydraulic pumps, &c. H. Williams, Manchester.	25th Nov. 16,199
Gas engines. P. J. Ravel, London.	26th Nov. 16,257
Gas engines. T. Sturgeon, London.	28th Nov. 16,309
Guiding driving bands on to fast or loose pulleys. R. Hornsteiner, London.	26th Nov. 16,286
Horse cloths. T. F. Forth, Halifax.	9th Nov. 15,278
Hosiery and machinery therefor. F. Moore and J. Palmer, London.	23rd Nov. 16,080
Imitation seal-skin, &c. H. Lister, Halifax.	16th Nov. 15,697
Jacquard looms. W. P. Thompson, Liverpool.	2nd Nov. 14,926
Knitting machines. C. Wilson and G. Roberts, Grimsby.	5th Nov. 15,073

Making heddles of looms. W. R. Lake, London.	15th Nov. 15,654
Mules for spinning. A. Koechlin, London.	19th Nov. 15,942
Manufacture and ornamentation of woven west pile fabrics. J. Wilkinson, Manchester.	21st Nov. 15,964
Mode of, and apparatus for, enamelling loom spindles, &c. W. Atkinson and G. A. J. Schott, Bradford.	22nd Nov. 16,017
Mounting of under grids of carding engines. G. and E. Ashworth, Manchester.	24th Nov. 16,156
Pickers of looms. G. Jackson and R. Crook, Manchester.	9th Nov. 15,270
Pickers for looms. W. H. Armistead, Halifax.	12th Nov. 15,465
Preventing or minimising unevenness in sliver arising from stripping, &c., in carding engines. P. Knowles (T. Barton and Sons), London.	14th Nov. 15,548
Pickers and method of connecting them to picking sticks of looms. A. Broadbent, J. W. Sykes, and R. Gledhill, Halifax.	17th Nov. 15,755
Placing cop tubes on spindles. Messrs. Swailes, London.	17th Nov. 15,780
Quilted fabrics. A. B. and C. E. Dobell, London.	22nd Nov. 16,068
Rollers for cotton spinning, &c. G. Batten.	7th Nov. 15,120
Rollers for stretching fabrics. J. McKean, Manchester.	9th Nov. 15,269
Rendering woven fabrics, &c., non-inflammable. T. G. Lee, Manchester.	16th Nov. 15,693
Rendering textiles waterproof. T. F. Wiley, Bradford.	19th Nov. 15,900
Raising nap on textile fabrics. W. Hampson and E. Marshall, Manchester.	24th Nov. 16,161
Screw gill boxes for preparing fibres. G. W. Douglas and J. Shaw, Bradford.	29th Oct. 14,724
Stentering and drying machines. D. Stewart, Glasgow.	31st Oct. 14,790
Selvaige motion. T. Blezard and W. Nelson, Padiham.	1st Nov. 14,845
Scouring wool. C. Robeson, Birmingham.	8th Nov. 15,178
Spinning mules. H. Ashworth, London.	8th Nov. 15,208
Shuttle-guards. J. C. Fielding and W. Slater, Manchester.	9th Nov. 15,283
Shuttle-guards. J. Shackleton, Halifax.	10th Nov. 15,343
Stop-motions for spinning, twisting, or doubling. E. Haigh and E. Hargreaves, Halifax.	11th Nov. 15,416
Shuttle-guards for looms. R. Brown, Preston.	12th Nov. 15,480
Stop motions for knitting fibrous substances. W. Rothwell, London.	15th Nov. 15,621
Silk combs for dressing silk. F. Fleming, Halifax.	16th Nov. 15,683
Securing the ends of tapes for driving the spindles of spinning, &c., machines. John Day, Bradford.	17th Nov. 15,736
Spindles for spinning machinery. J. Hogg and A. H. Robinson, London.	18th Nov. 15,865
Self-contained spindles for ring spinning and doubling fibres. S. Tweedale, Halifax.	23rd Nov. 16,095
Stockinette frames. R. H. Londrum and S. Mitchell, Halifax.	25th Nov. 16,201
Spun silk yarns. J. H. Chambers, Leeds.	28th Nov. 16,319
Spinning wet-spun yarns of flax, &c., in form of pirns or cops. J. V. Eves, Belfast.	28th Nov. 16,321
Shearing wool, &c. V. Petherick, London.	28th Nov. 16,336
Taking-up motion of looms. S. Whitaker, London.	16th Nov. 15,686
Twisting frames. A. Combe, Belfast.	19th Nov. 15,918
Trap twisting frames. A. Ambler, Halifax.	21st Nov. 15,961
Ventilating fans. W. Yates, Manchester.	11th Nov. 15,405
West catch for tweed looms. W. Aitkin, Glasgow.	28th Oct. 14,678
Washing, soaping, and scouring piece goods. D. Stewart and R. Walker, Glasgow.	1st Nov. 14,843
Worsted and other yarns. J. Lodge, Huddersfield.	1st Nov. 14,850
Weaving borders of towels, table covers, &c. F. Morrison and E. Beveridge, Dunfermline.	7th Nov. 15,122
West stop motion. J. E. Stephenson, Halifax.	8th Nov. 15,172
"Willow" machines. J. Holt and J. Tweedale, Manchester.	8th Nov. 15,229
Woven bands and belts. S. Ogden, Manchester.	9th Nov. 15,294
Washing, scouring, &c., fibres and fabrics. M. Ashworth and R. Wild, Rochdale.	10th Nov. 15,350
Winding yarn or thread. J. Corrigan, Manchester.	17th Nov. 15,746
Winding yarns or threads. J. Corrigan, Manchester.	17th Nov. 15,747
Winding or reeling yarns or threads. W. T. and J. H. Stubbs, Manchester.	17th Nov. 15,796
Waterproofing and machinery therefor. T. F. Wiley, Bradford.	19th Nov. 15,899

Patents Sealed.

13,401	13,482	10,261	10,293	1,679	11,217	13,608	13,634
658	11,981	12,252	13,916	14,610	9,861	13,089	14,318
1,874	6,036	9,273	13,546	14,039	14,133	14,202	14,255
14,283	14,835	8,223	10,483	11,510	14,233	14,311	14,429
12,599	13,500	13,814	15,033	5,939	9,179	10,593	11,029
12,386	14,227	14,589	14,673	15,034	15,581	8,511	11,101
11,140	5,147	11,188	14,515	15,035	15,363	16,059	9,274
11,358							

